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Columbia-North Pacific Region



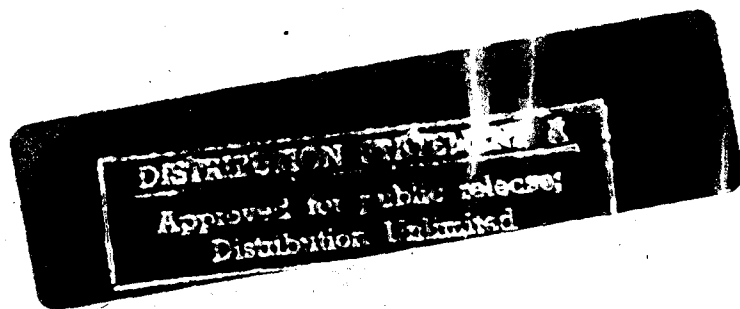
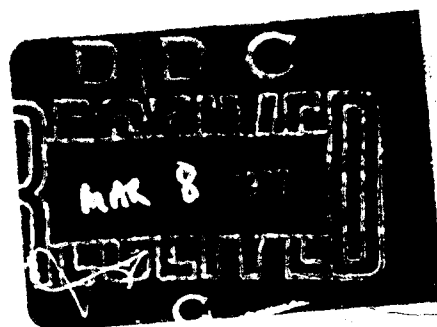
Comprehensive Framework Study
of Water and Related Lands

APPENDIX

I



HISTORY OF STUDY



SUBMITTED BY

PACIFIC NORTHWEST RIVER BASINS COMMISSION
1 COLUMBIA RIVER, VANCOUVER, WASHINGTON

DECEMBER 1971

PARTICIPATING STATES AND AGENCIES

STATES

Idaho	Nevada	Utah	Wyoming
Montana	Oregon	Washington	

FEDERAL AGENCIES

Department of Agriculture	Department of Housing & Urban Development
Economic Research Service	Department of Transportation
Forest Service	Department of the Interior
Soil Conservation Service	Bonneville Power Adm.
Department of the Army	Bureau of Indian Affairs
Corps of Engineers	Bureau of Land Management
Department of Commerce	Bureau of Mines
Economic Development Adm.	Bureau of Outdoor Recreation
National Oceanic & Atmospheric Administration	Bureau of Reclamation
National Weather Service	Fish and Wildlife Service
National Marine Fisheries Service	Geological Survey
Department of Health, Education, & Welfare	National Park Service
Public Health Service	Department of Labor
	Environmental Protection Agency
	Federal Power Commission

History of Study



APPENDIX I

Columbia-North Pacific Region
Comprehensive Framework Study
of Water and Related Lands. Appendix I.
History of Study,

E. L./White, G. J./Gronewald,
H. H./Ralphs G. E./Van Santen

December 1971

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Submitted by

Pacific Northwest River Basins Commission
Vancouver, Washington

410 072

Prepared by
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This appendix to the Columbia-North Pacific Region Framework Report was prepared at field level under the auspices of the Pacific Northwest River Basins Commission. It is subject to review by the interested Federal agencies at the departmental level, by the Governors of the affected States, and by the Water Resources Council prior to its transmittal to the President of the United States for his review and ultimate transmittal to the Congress for its consideration.

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INTRODUCTION

↙ This Appendix I is intended to provide a broad history of the Columbia-North Pacific Region Comprehensive Framework Study, extending from its inception through completion of the study and submission of the report and ~~appendices~~ by the Pacific Northwest River Basins Commission to its member agencies and the Water Resources Council. ↘ The first section, covering authorization, purpose, and scope, defines the study area and the level of detail obtained and outlines the broad objectives of the study. Following this is a listing and brief description of previous studies of a comprehensive nature covering major areas or basins within the region. ↘ No attempt is made to list the many specific project or limited purpose studies which have contributed to the total effort.

↘ The third section describes the organization established for conduct of the study and how it was funded and administered. Special attention is given to the coordination of the study necessitated by the numerous State and Federal agencies participating. All of the cooperating agencies are identified.

The appendix concludes with a section describing some of the public information activities concerning the study which have been engaged in by the Pacific Northwest River Basins Commission and by study participants. ↗

INTERNATIONAL MUSEUM OF ETHNOLOGY



A U T H O R I Z A T I O N ,
P U R P O S E , A N D S C O P E

A U T H O R I Z A T I O N

The Columbia-North Pacific Region Framework Study of water and related lands is one of 20 similar studies scheduled to cover the United States, including Alaska, Hawaii, and Puerto Rico. This national planning program stems from recommendations made in 1961 by the Senate Select Committee on National Water Resources and further defined by Senate Document 97, 87th Congress, 2d Session. The 20 regional framework studies will provide a major part of the nationwide comprehensive study program that was authorized by the Water Resources Planning Act of 1965 (PL 89-80).

The Columbia-North Pacific Study is a coordinated joint effort of many agencies in the seven Pacific Northwest States and some 20 agencies in six Federal Departments and the Federal Power Commission. Responsibility for coordination and direction of this joint effort has been vested in the Pacific Northwest River Basins Commission since June 1967. Prior to establishment of the Commission, responsibility for coordination rested with the Columbia Basin Inter-Agency Committee through its Subcommittee on Coordinated Planning.

The study was initiated in FY 1966 and originally scheduled for completion at the end of FY 1970. However, budget cuts were experienced during the course of the study, and it was reprogrammed to finish at the end of FY 1971.

Specific congressional authorities for Federal participation in the study are as follows:

1. Pacific Northwest River Basins Commission--Water Resources Planning Act of 1965 (PL 89-80).
2. Department of Agriculture--Soil Conservation Service, Economic Research Service, and Forest Service. Section 6 of the Watershed Protection and Flood Prevention Act, (PL 83-566) 68 Stat. 666, 668, as amended.
3. Department of the Army--Corps of Engineers. Section 208 of Flood Control Act of 1965 (PL 89-298), 79 Stat. 1073, 1084.

4. Department of Commerce

- a. Business and Defense Services Administration. Act of March 4, 1913, (5 U.S.C. 596) and Department Order 152 pursuant to authority of Reorganization Plan 5 of 1950.
- b. Environmental Science Services Administration. Section 601 of the Economy Act of 1932, 47 Stat. 382, 417.

5. Department of Health, Education, and Welfare--
Public Health Service. Sections 301 and 361 of the Public Health Service Act of 1944 (PL 78-410) 58 Stat. 683; Section 2k of the Water Quality Act of 1965 (PL 89-234), 79 Stat. 903; Reorganization Plan No. 2 of 1966 and the Interdepartmental Agreement "Health Aspects of Water Pollution Control" approved September 1, 1966.

6. Department of Housing and Urban Development--
Section 702, Housing Act of 1954: Title II, Housing Amendments of 1955; Sections 702 and 705, Housing Act of 1961; Sections 702 to 704, Housing and Urban Development Act of 1965; Title X, National Housing Act.

7. Department of the Interior

- a. Bonneville Power Administration. Bonneville Project Act of 1937, 50 Stat. 731, as amended, and Secretary of Interior Order No. 2860, January 12, 1962.
- b. Bureau of Indian Affairs. General Allotment Act of 1887, 24 Stat. 388, 390.
- c. Bureau of Land Management, Classification and Multiple Use Act of September 19, 1964 (PL 88-607), 78 Stat. 986. O&C Act of August 28, 1937, 50 Stat. 874. Taylor Grazing Act of June 28, 1934, 48 Stat. 1269, as amended. Public Land Administration Act of July 4, 1960 (PL 86-649), 74 Stat. 506.
- d. Bureau of Mines. Section 601 of the Economy Act of 1932, 47 Stat. 382, 417.
- e. Bureau of Outdoor Recreation. The Act of May 28, 1963 (PL 88-29), 77 Stat. 49.

- f. Bureau of Reclamation. Federal Reclamation Laws, Act of June 17, 1902, 32 Stat. 388, and acts amendatory thereof or supplementary thereto.
 - g. Environmental Protection Agency. The Federal Water Pollution Control Act of July 9, 1956 (PL 84-660), 70 Stat. 498, as amended; the Water Quality Act of 1965 (PL 89-234), 79 Stat. 903; and President's Reorganization Plan Number 2 of 1966, 30 Fed. Reg. 14483.
 - h. Fish and Wildlife Service. Fish and Wildlife Coordination Act, 48 Stat. 401, as amended.
 - i. Geological Survey. Section 601 of the Economy Act of 1932, 47 Stat. 382, 417.
 - j. National Park Service. Park, Parkway, and Recreation Area Study Act of June 23, 1936, 49 Stat. 1894; Antiquities Act of June 8, 1906, 34 Stat. 225; Historic Sites Act of August 21, 1935, 49 Stat. 666; and Historic Preservation Act of October 15, 1966, 80 Stat. 915.
8. Federal Power Commission--The Federal Power Act of June 10, 1920, 41 Stat. 1063, as amended, and various flood control and river and harbor acts substantially as stated in Section 4 of the Flood Control Act of 1938, 52 Stat. 1215, 1216.

PURPOSE

The primary purpose of the regional framework studies is to provide a broad guide to the best use, or combination of uses, of water and related land resources of a region to meet foreseeable short- and long-term needs. This involves broad scaled analyses of the region's water and related land resource problems, both present and future, and general appraisals of the probable nature, extent, and timing of measures for their solution.

Also, the Columbia-North Pacific Framework Study will serve as the first stage of the Pacific Northwest River Basins Commission's comprehensive joint plan. One of the principal responsibilities of river basin commissions under the Planning Act of 1965 is to prepare and keep up-to-date a comprehensive joint plan for water and related land resources development in their area. At its meeting of May 20, 1969, the Pacific Northwest River Basins Commission adopted a definition for its comprehensive joint plan which provides that the

plan is to be prepared in stages and will evolve through (1) broad regional analysis of framework scope, (2) more detailed analysis in the subregions; developing recommendations for desirable projects where data are sufficient to justify authorization, and (3) recommendations of additional in-depth studies necessary for implementation of the comprehensive plan. The Columbia-North Pacific Framework Study fulfills the first stage of the comprehensive joint plan.

PLANNING OBJECTIVES

The Columbia-North Pacific Framework Study has been conducted to meet the three broad objectives of economic efficiency, regional development, and environmental quality. These planning objectives were adopted by the River Basins Commission in the fall of 1968. They supplement the national objectives contained in Senate Document No. 97, which include development, preservation, and well-being of people. Other objectives which have been considered are: acceptability, income redistribution, political equity, and population and industry distribution.

The economic efficiency objective includes the identification of needs and methods of meeting needs in the least costly manner in terms of the constraints imposed by the national economic projections. The regional development objective includes the identification of opportunities to stimulate regional economic development and the attainment of a desired pattern of regional income or development induced through water and related land resources investments. The environmental quality objective is the maintenance or improvement of the quality of the region's environment for man.

SCOPE

The Columbia-North Pacific Region includes all of the Columbia River drainage in the United States, the coastal streams of Oregon and Washington, and that part of the Great Basin in southern Oregon. This area of approximately 274,000 square miles encompasses all of the State of Washington, nearly all of Idaho and Oregon, western Montana, and parts of Nevada, Utah, and Wyoming (figure 1).

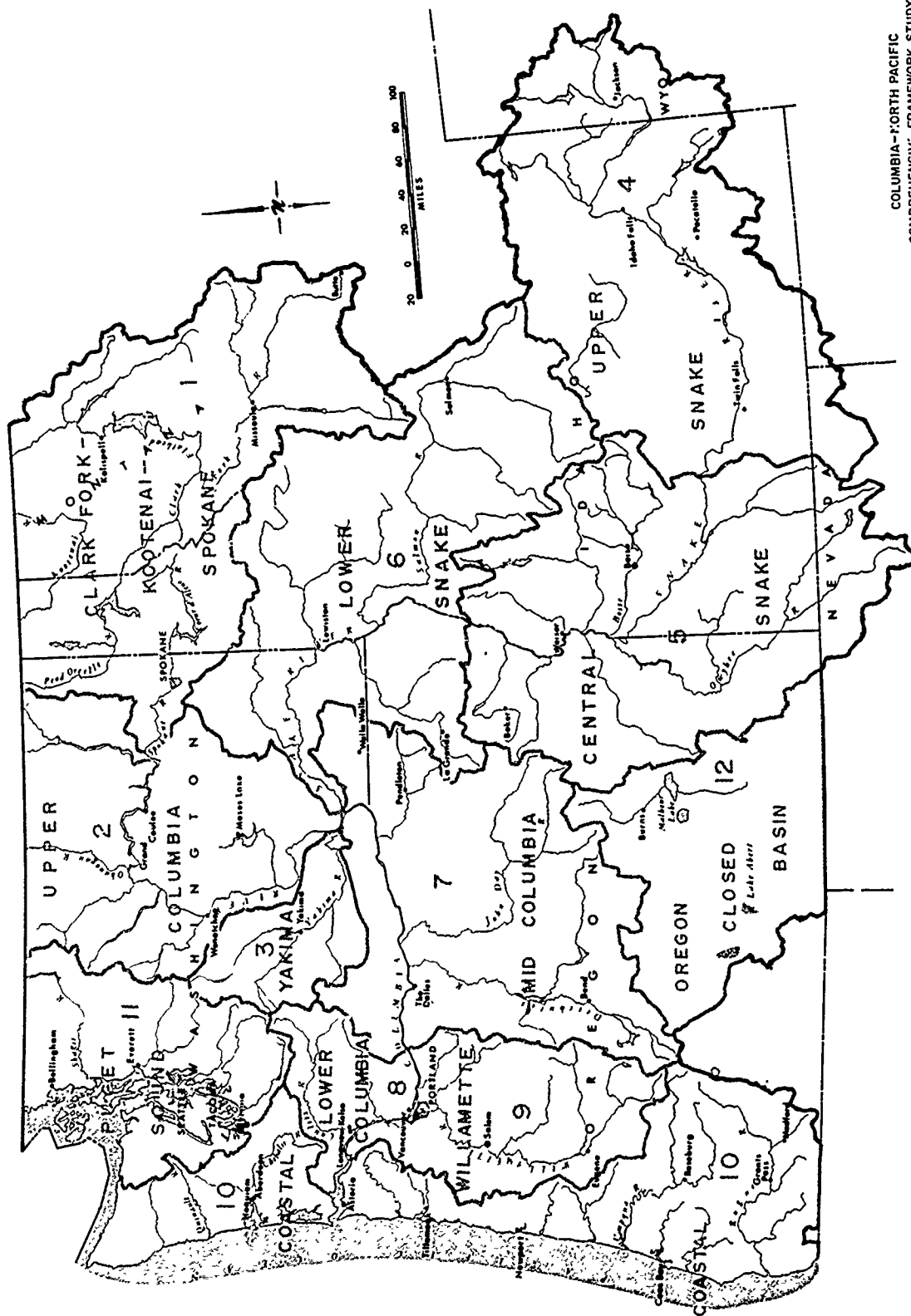
The Study was broken down into several basic elements. The first is an inventory, the second is economic projections, the third is development of future needs from these projections. A framework plan then was formulated with full consideration of all alternatives and a program for implementation developed. Finally the report and appendices were prepared and distributed. The Columbia-North Pacific Study is comprehensive in that all uses and

needs of water and related lands are considered simultaneously for the total regional area. However, as provided in the Water Resources Council's "Guidelines for Framework Studies," the study is based primarily on readily available data. Considerable effort was expended, to consolidate, compile, and analyze data that were scattered in many reference documents and in field offices of Federal and State agencies.

Basic data on past trends and future projections of populations, employment, income, industrial output, agricultural production, etc. were obtained from studies conducted by the Office of Business Economics, Department of Commerce, and the Economic Research Service and Forest Service, Department of Agriculture, under a coordinated program sponsored by the Water Resources Council. The needs for goods and services relevant to water and related lands for the target years 1980, 2000, and 2020, especially under the economic efficiency objective, were derived largely from these projections.

All needs and uses of water and related lands were analyzed, including some not always previously recognized as being water resource development functions. These will include preservation and enhancement of natural environment, coastal zone and estuaries, water quality and pollution control, municipal water, conservation, and watershed protection, as well as the more commonly known functions such as irrigation, hydroelectric power, navigation, and flood control.

While the best alternative could be selected for part of the region, there are basins or subareas where the complexity of problems and wide array of alternatives, coupled with lack of available data, precluded the selection of the best plans and programs. In those instances, interdisciplinary studies were recommended and alternates which meet the needs with the least impact on the environmental quality have been used for purposes of this study. Future studies could reaffirm, modify, or change the selected plan. Framework or alternating plans are defined in terms of gross storage requirements with time and general geographic distributions; local protection works with the indicated number of locations in each subregion; general reaches of streams where low flows should be augmented or pollution loads decreased for improvement of water quality; management or utilization practices of related lands by acres or square miles by geographic patterns; extent of water based recreation, including hunting and fishing, and identification of potentials for preservation of free-flowing streams, scenic roads, and roadless areas; and similar general terms for other functions of water and related lands.



COLUMBIA-NORTH PACIFIC
COMPREHENSIVE FRAMEWORK STUDY

THE REGION
1968

FIGURE 1

REVEREND

PREVIOUS STUDIES

Studies of water resource development in the United States have been carried on in varying degrees almost since the formation of the Nation. The Columbia-North Pacific Region, too, has been the subject of many such investigations at the Federal, State, and local level, by private organizations, and by individuals. Most of these studies have been concerned with small sections of the region or have dealt with a particular water use. They were made in varying degrees of detail to suit particular authorities or requirements. However, comprehensive appraisals of the Nation's natural resources are a comparatively recent development. A general awareness of the need for these studies spread across the Nation in the early 1930's and several studies dealing with various aspects of resource development were completed and projects realized. Since then, studies have increased in both scope and frequency.

In the annotated list of previous studies (pages 39 to 63) are a myriad of recent reports dealing with water resource development. Also included with this list are the State and Federal agencies that conducted these studies; with a brief sentence or two explaining their general responsibilities. These studies by no means represent the entire production of the agencies listed but rather a selection of the more pertinent ones.

CO-ORDINATION-ADMINISTRATION



COORDINATION AND ADMINISTRATION

Since its establishment in March 1967, the Pacific Northwest River Basins Commission has been the organization responsible for coordination of water and related land resource planning in its area. Because of the many State and Federal agencies involved, this coordination is especially important for the comprehensive studies, such as Columbia-North Pacific Type 1 and the Willamette and Puget Sound Type 2 studies. The Commission has representation from the five Northwest states and all of the Federal Departments with an interest in water and related lands. Commission staff members have been assigned specifically to the coordination of these studies.

The history of interagency coordination on matters relating to water goes back many years prior to establishment of the Commission. During the 21-year period from 1946 to 1967, the Columbia Basin Inter-Agency Committee (CBIAC) was the organization which provided coordination of planning and water management in the region. It was through the aegis of CBIAC that early planning for the Columbia-North Pacific Comprehensive Framework Study was accomplished.

Coordination of planning budgets for the Columbia-North Pacific Study (then called the Columbia Basin Study) was first requested of CBIAC by the Ad Hoc Water Resources Council in July 1963 for a start in Fiscal Year 1965. However, local representatives of Departments of Agriculture, Army, Interior, and Health, Education, and Welfare requested a postponement of 1 year in the start of this study. Consequently, at its meeting in August 1963, CBIAC adopted a resolution requesting a delay in submission of a coordinated plan and cost estimates for the Columbia Basin study. This request was agreed to by the Ad Hoc Water Resources Council, and the study was postponed to Fiscal Year 1966. Budgets for the study were prepared in 1964. At that time, it was decided that the first year's program would be rather minimal, with primary emphasis on identifying guidelines, scope, and content for the planning effort, assembling relevant reports and data, identifying agency interests and responsibilities, preparing a study plan, and related activities.

Actual coordination of comprehensive studies under CBIAC was accomplished by its Subcommittee on Coordinated Planning. In May 1965, preparatory to a Fiscal Year 1966 new start, the Subcommittee adopted a study proposal for the Columbia-North Pacific Type 1 Comprehensive Study which was subsequently approved by CBIAC. In order to insure full coordination and effective utilization of

Federal and State capabilities in the study, a full-time Technical Staff was proposed. The Subcommittee on Coordinated Planning was to supply policy guidance, as appropriate. Membership on the Technical Staff was to be provided by detailing professional personnel from each of the major planning agencies to the extent that their agency budgets would permit. The Departments of Agriculture; Army; Health, Education, and Welfare; and Interior were each to assign a full-time professional person to the activity, with part- or full-time contributions coming from the other Federal agencies and the states which desired to be working partners.

The chairman of the Technical Staff was to be designated by the Subcommittee on Coordinated Planning, subject to the approval of CBIAC. Clerical support was to be provided by the participating agencies. Since the effectiveness of this staff would be related to the opportunity for its people to devote their full time to the study, headquarters at a central location was considered important. Members of the Technical Staff were to serve as liaison between study activities and their respective agencies or departments.

During the first year of operation the following items were to be carried out:

1. Identify the guidelines, techniques, divisions, scope and content, method and program for the whole comprehensive planning effort and covering report.
2. Prepare and submit to CBIAC and to the respective agencies a plan for management and performance of the study effort.
3. Locate and assemble relevant and available reports, data, bibliography, and other source material for the planning effort.
4. Appraise the status of plans and data for the basin and for each function.
5. Identify and appraise salient resource conditions, problems and issues, constraints and opportunities.
6. Formulate a statement of goals for resource development and the comprehensive plan.
7. Identify agency interests and responsibilities.
8. Explore the basic relationships, and the potentials and means of effective intergovernmental, institutional, and public cooperation in the planning effort.

9. Establish coordination procedures and a system to insure against overlapping effort by various agencies and departments.
10. Develop a format for the report.

In the following years of study, the Technical Staff was to:

1. Complete all unfinished items in the above.
2. Actively, through individual and related agency support, proceed with the development of the study.
3. Prepare periodic progress reports.
4. Coordinate all study efforts with the objective of avoiding duplication, holding studies to essentials, and minimizing costs.
5. Prepare budget requirements.
6. Prepare and coordinate preparation of report and appendices.

First funds for the Columbia-North Pacific Study were received rather late in Fiscal Year 1966, and Technical Staff personnel were selected and working full time by January 1966. The Technical Staff was initially composed of four people representing the Departments of Agriculture, Army, Interior, and Health, Education, and Welfare. However, the staff member from the Department of Health, Education, and Welfare was later withdrawn after the Federal Water Pollution Control Administration was transferred to the Department of the Interior. The Department of the Interior representative was selected as chairman and served in this dual capacity until his transfer to the River Basins Commission, when another Interior representative was named.

Initial efforts of the Technical Staff were directed toward preparation of the Plan of Study, with special emphasis on those portions that would permit full study participation by the states and Federal agencies as early as possible. The subregion boundaries were finalized, a main report and 16 appendices agreed upon, and preliminary outlines prepared for the appendices. During March, April, and May 1966, the Technical Staff held a series of 12 appendix conferences, open to all who desired to participate, to outline the intended work and select a lead agency for each appendix. The lead agency then designated a coordinator or chairman to direct preparation of that particular appendix. In this manner, responsibility for each appendix was assigned to a coordinator or work group.

chairman representing the lead agency who was to be assisted by representatives from the states and Federal agencies desiring to participate. Responsibility for coordination of this particular part of the study effort then became that of the coordinator or work group chairman. The selected appendices and lead agencies are as follows:

<u>APPENDIX</u>	<u>LEAD AGENCY</u>
I. History of Study	Technical Staff
II. The Region	Technical Staff
III. Legal & Administrative Background	Technical Staff
IV. Land & Mineral Resources	Soil Conservation Service
V. Water Resources	Geological Survey
VI. Economic Base & Projections	Economic Research Service
VII. Flood Control	Corps of Engineers
VIII. Land Measures & Watershed Protection	Soil Conservation Service
IX. Irrigation	Bureau of Reclamation
X. Navigation	Corps of Engineers
XI. Municipal & Industrial Water Supply	Federal Water Pollution Control Administration
XII. Water Quality & Pollution Control	Federal Water Pollution Control Administration
XIII. Recreation	Bureau of Outdoor Recreation
XIV. Fish & Wildlife	Bureau of Sport Fisheries & Wildlife
XV. Electric Power	Bonneville Power Administration
XVI. Comprehensive Framework Plans	Technical Staff

To further insure coordination, the Chairman of CBIAC asked each of the seven Northwest States and each Federal agency desiring to participate in the study to designate a liaison representative who could work directly with the Technical Staff. This group has been used to coordinate all budget matters, make assignments to the study groups, distribute Columbia-North Pacific materials within the respective states and Federal agencies, and coordinate the review of study documents.

The organization for coordinating and accomplishing the Columbia-North Pacific Study is shown in figure 2. After the selection of the study groups and coordinators, the first tasks were to review the preliminary appendix outlines prepared by the Technical Staff; make necessary revisions therein; prepare a work plan, with assigned study elements; prepare a work schedule; and estimate budgetary requirements. This activity was accomplished in cooperation with the Technical Staff and occupied most of the remainder of Fiscal Year 1966. The information was incorporated in the Plan of Study, dated December 1966.

In late 1966, the Governors of five Pacific Northwest States requested the formation of a river basins commission under terms of the Water Resources Planning Act of 1965. On March 6, 1967, the Pacific Northwest River Basins Commission was established, the first in the Nation. In June 1967, the Commission formally assumed the functions and responsibilities of the Columbia Basin Inter-Agency Committee. The Commission office was temporarily located in Portland, Oregon. However, the following November its headquarters were moved to Vancouver, Washington. At the same time, the Columbia-North Pacific Technical Staff was moved from Portland to Vancouver to be housed with the Commission in order to insure maximum coordination between the study and other Commission activities.

The Commission, in exercising its responsibilities for coordination of the Columbia-North Pacific Study, adopted a work program which included a provision that "Coordination of this (Columbia-North Pacific) study will be accomplished as follows: The Chairman of the Technical Staff for the study will be a Commission employee and will work under the supervision of the Director of Planning. Other personnel will be assigned to the Technical Staff by their agencies and continue to serve as at present." In October 1967, the Department of the Interior representative on the Technical Staff transferred to the Commission staff and was retained as Chairman. The Department of the Interior position on the Technical Staff was subsequently filled, thus making a 4-man staff composed of representatives of the Pacific Northwest River Basins Commission and the Departments of Agriculture, Army, and Interior. By this time, the Technical Staff also had supporting personnel comprised of two secretaries, one illustrator, and a geographer who assisted in editing, writing, and other matters.

In December 1968, the Commission approved the proposed organization for accomplishing the formulation of comprehensive framework plans and preparing Appendix XVI. The organization included six subregion plan formulation task forces and a Regional Plan Formulation Task Force consisting of representatives of the States and Federal Departments and the existing Technical Staff.

COLUMBIA-NORTH PACIFIC — COORDINATION ORGANIZATION

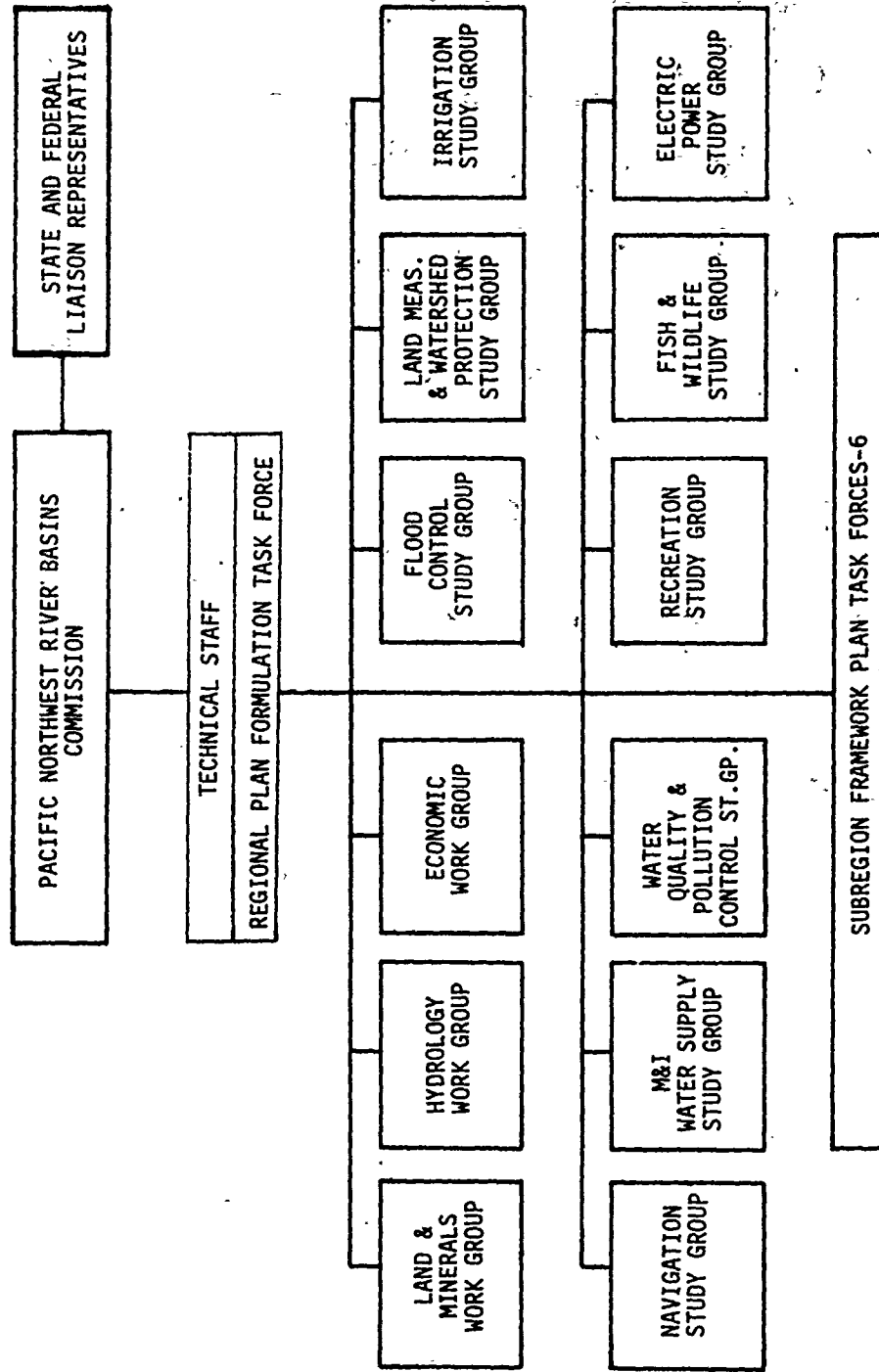


FIGURE 2.

The subregion task forces were each chaired by a representative of the appropriate state, with a vice chairman from one of the Federal agencies. Figure 3 shows the organization established for developing the framework plans. Areas of responsibility of each of the six subregion plan formulation task forces are shown on figure 4.

When funds were allocated for Fiscal Year 1968, it was apparent that the reductions, coupled with anticipated reductions in Fiscal Year 1969, precluded meeting the original study completion date of Fiscal Year 1970. A one-year extension of study time was agreed to by the Water Resources Council and all Federal and State agencies involved in the program. Consequently, the remaining study effort was analyzed, and required funds were estimated and budgeted on the basis of completing the study at the end of Fiscal Year 1971. This revision was reflected in the Coordinated Comprehensive River Basin Planning Estimates for Fiscal Year 1970, submitted in April 1968. The resulting schedule for completion of the Columbia-North Pacific Study is shown in the Network Analysis dated April 1968 (figure 5).

The organization established for coordination and administration of the Columbia-North Pacific Study was retained until its completion. Coordination occurred at several levels, both intermittently and on an almost continuous basis. Top level policy coordination was exercised by the Pacific Northwest River Basins Commission. Administration and policy coordination, as well as coordination of review, within the states and individual Federal agencies was effected by the liaison representatives. Day-to-day direction of study content and scope; coordination between work groups and task forces; and guidance on format, glossary, illustrations, printing, etc. were the responsibility of the full-time Technical Staff. In addition, this staff had responsibility for preparing three of the appendices and the Main Report as well as leadership responsibility for the plan formulation effort. Coordination of technical aspects within the basic data and functional appendices, and in plan formulation in the subregion, was the responsibility of the various work groups, study groups, and task forces.

ORGANIZATION FOR FRAMEWORK PLAN FORMULATION
COLUMBIA-NORTH PACIFIC FRAMEWORK STUDY

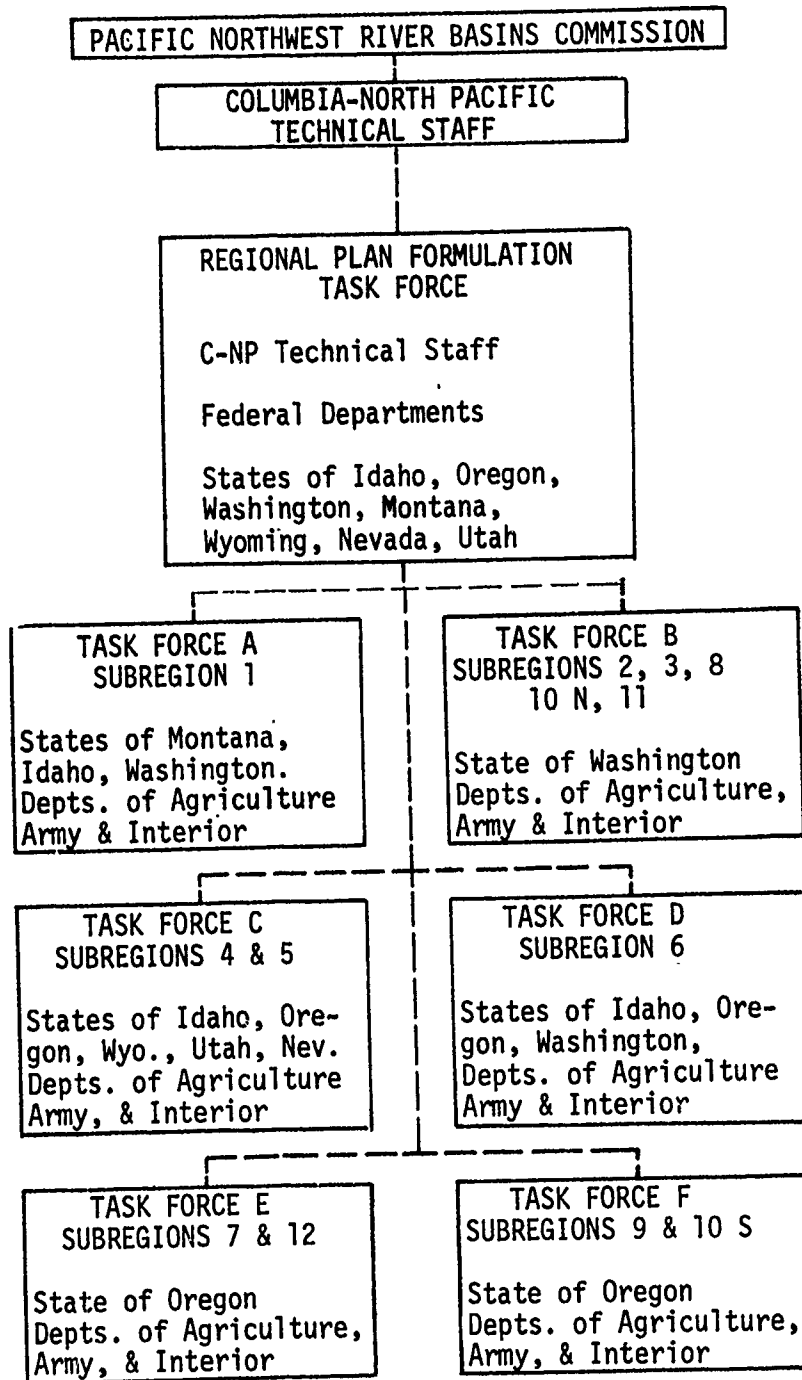
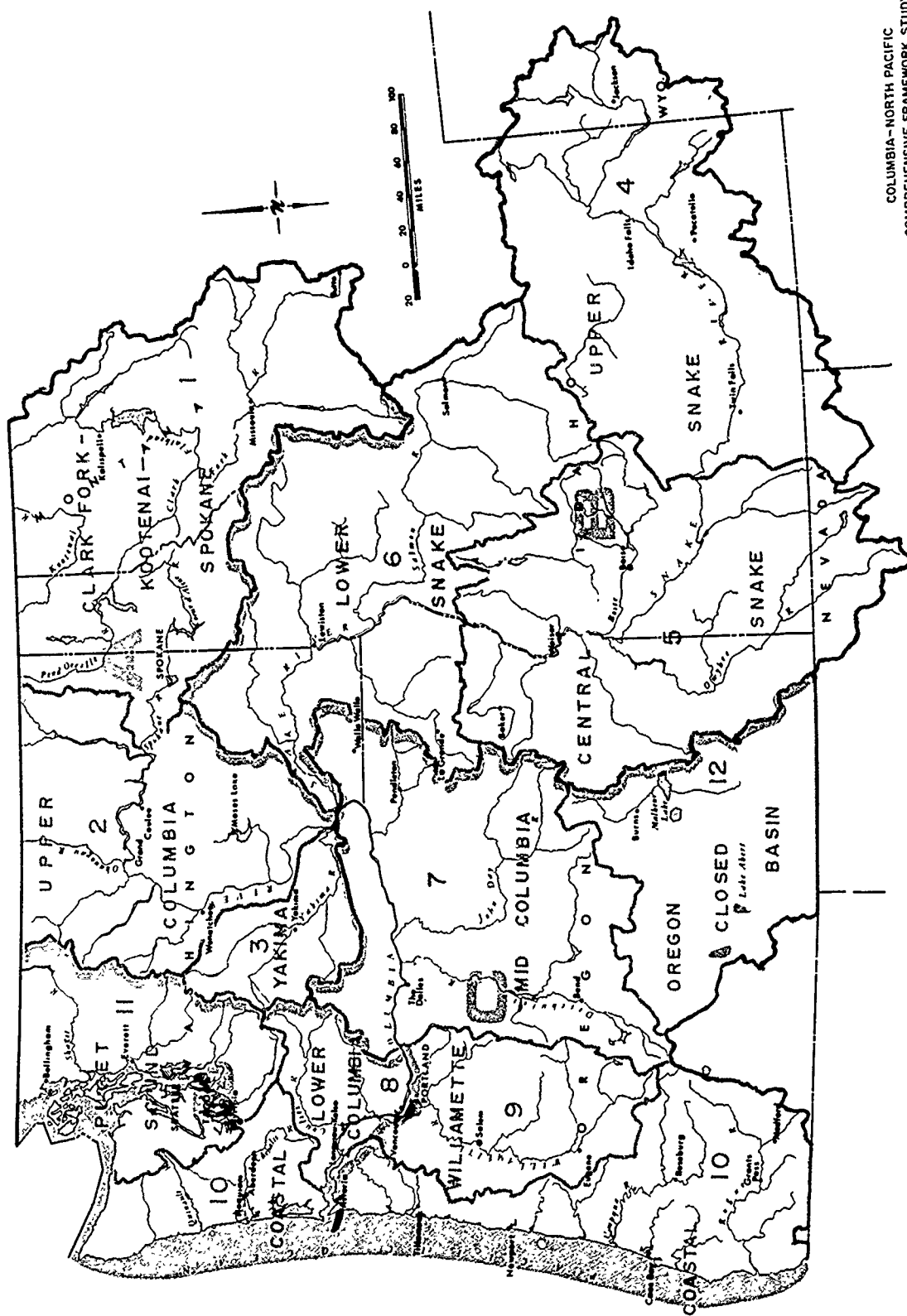
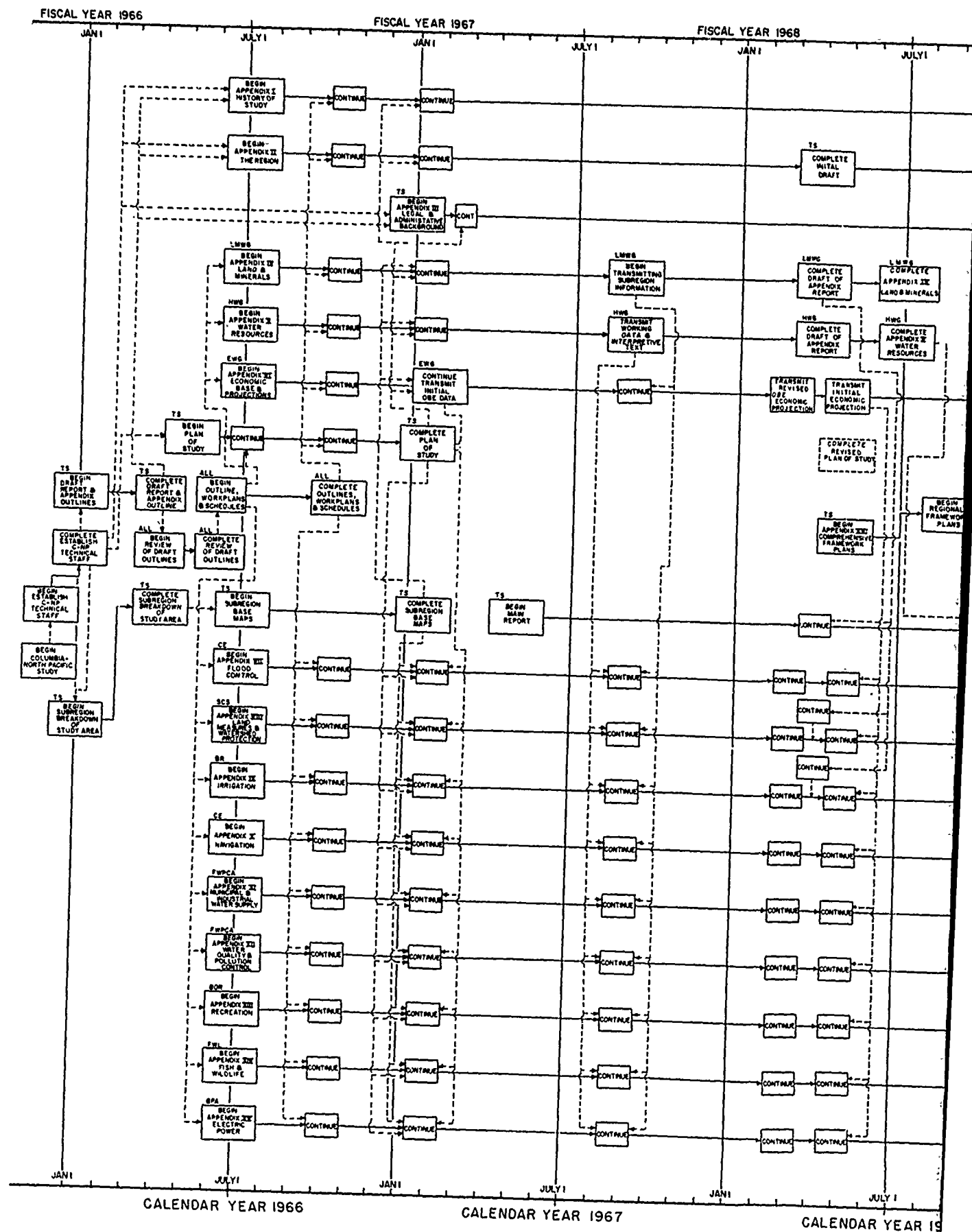
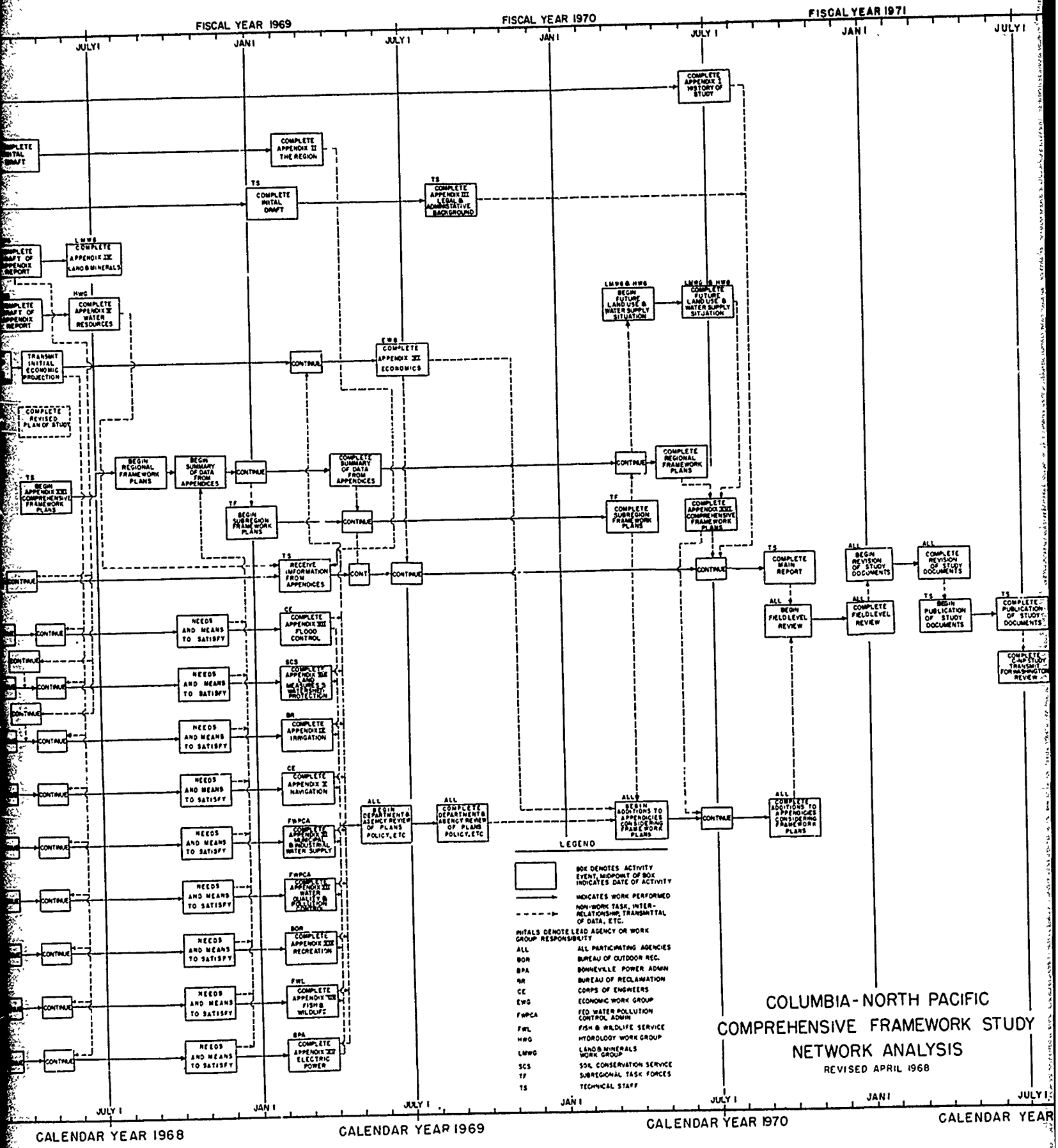


FIGURE 3.



COLUMBIA-NORTH PACIFIC
COMPREHENSIVE FRAMEWORK STUDY
**PLAN FORMULATION
AREAS**
THE REGION
1966





CONFIDENTIAL - AGENCE - 130

COOPERATING AGENCIES

Numerous agencies within the States of Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming, and the Federal Departments of Agriculture; Army; Commerce; Health, Education, and Welfare; Housing and Urban Development; Interior; Labor; and Transportation, as well as the Federal Power Commission and the Pacific Northwest River Basins Commission, have cooperated on the Columbia-North Pacific Framework Study. Most of the agencies have been funded directly for the study, but others have participated to the extent possible as a part of their day-to-day operations. The major funding for the study, however, has been carried in the budgets of the Departments of Agriculture, Army, and Interior. Agencies carrying the major load in completing various segments of the study are outlined in the following paragraphs.

Main Report The Main Report was prepared by the Columbia-North Pacific Technical Staff, with assistance from several of the study work groups, largely from material contained in the 16 appendices. The Technical Staff consisted of representatives of the Pacific Northwest River Basins Commission and the Departments of Agriculture, Army, and Interior. In addition, assistance in preparing the conclusions and recommendations was obtained from other members of the Commission Staff.

Appendix I - History of Study Appendix I was prepared by the Technical Staff, with material for inclusion in the section on "Previous Studies" being furnished by the states and the several Federal agencies.

Appendix II - The Region Appendix II was also compiled by the Technical Staff, with much of the research and writing being done by support staff personnel assigned from the Corps of Engineers. Valuable assistance was given by members of the Hydrology, Economics, and Land and Minerals Work Groups.

Appendix III - Legal and Administrative The appendix on legal and administrative background was compiled by the Technical Staff, largely from material originally prepared by others. The part on "Federal Legislation" was written by the Technical Staff, using material assembled by the Missouri River Basin Study for a similar purpose. This was then reviewed and modified by the Federal

agencies and the Regional Solicitor's Office, Department of the Interior. The section on "Treaties and Compacts" was written originally by the Regional Solicitor's Office and reviewed by the states and Federal agencies. Material prepared for the Puget Sound Study was used as a first draft for the part dealing with "Federal Agencies." Each agency was responsible for any necessary editing or revisions. The part on "State Law, Policies, and Administration" consists of a section for each of the seven Northwest States prepared by the state.

Appendix IV - Land and Mineral Resources The Soil Conservation Service, Department of Agriculture, chaired the Land and Minerals Work Group in collecting, coordinating, and compiling the land and minerals data for the Columbia-North Pacific Region. Local administrative offices of the Federal Government, including the Forest Service and Soil Conservation Service in the Department of Agriculture and the Bureau of Land Management and Bureau of Mines in the Department of the Interior, provided a major portion of the basic information. Land ownership data were obtained from the agencies administering the various types of land within the region. Also, an important part of the data was initially provided by State Agricultural Experiment Stations and by the various State Departments of Mines and Mineral Resources in the region.

Appendix V - Water Resources The Water Resources Appendix was prepared by the Hydrology Work Group under the chairmanship of the Geological Survey. In addition to leadership responsibility, the Geological Survey was responsible for all of the parts of the appendix dealing with ground water and the section on Subregion 11, as well as compilation of the Regional Summary.

The Bureau of Reclamation was responsible for and prepared the sections on Subregions 2, 3, 4, 5, and 12, and corresponding parts of the Regional Summary. The Corps of Engineers had responsibility for preparing Subregions 1, 6, 7, 8, 9, and 10, and the corresponding parts of the Regional Summary. Specific work included the voluminous surface water quantity information, much of the climatological data, writing six computer programs, writing the text, and assembly, drafting, and reproduction. Valuable assistance was given by the Weather Bureau on the parts dealing with climatic factors and by the states on the parts dealing with water rights.

Appendix VI - Economic Base and Projections The Economic Research Service, Department of Agriculture, served as lead agency for Appendix VI, "Economic Base and Projection," and chaired the Economic Work Group. In this capacity, it was responsible for coordinating the data collection, analyses, projections, and preparation of the appendix.

Many agencies represented on the Economic Work Group have provided major portions of the appendix in the form of basic information, review of existing studies, analyses, projections, and preparation of draft material, and in-depth reviews of all material prepared for the appendix. These agencies include the Corps of Engineers, Forest Service, Bureau of Mines, Bureau of Reclamation, and Bonneville Power Administration. Other Federal and State agencies, with representation on the Economic Work Group, have provided useful suggestions and in-depth reviews of material prepared throughout all phases of the study.

The Economic Base Study has utilized much of the information from the Program of National and Regional Statistical Analyses and Regional Projections being conducted by the Office of Business Economics, Department of Commerce, and the Economic Research Service and Forest Service, Department of Agriculture, under the auspices of the Water Resources Council. This work, plus the numerous economic studies which are underway or completed by various State and Federal agencies in the Columbia-North Pacific Region, have been utilized and supplemented by agency studies in the field to provide the necessary elements of the economic investigations for the Columbia-North Pacific Study.

Appendix VII - Flood Control Leadership for the Flood Control Appendix was the responsibility of the Corps of Engineers. The Corps prepared all but three sections of each subregion analysis as well as the Regional Summary. Portions of the appendix, primarily those associated with protection of small watersheds and land practices to improve both land and water conditions, were prepared under the direction of the Soil Conservation Service.

The Weather Bureau provided those portions of the appendix relating to river forecasting. Several other Federal agencies assisted in providing data and reviewing draft material. These included the Bureau of Land Management, Bureau of Reclamation, Bureau of Indian Affairs, and the Forest Service. The States of Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming also assisted by reviewing report material.

Appendix VIII - Land Measures and Watershed Protection
The Soil Conservation Service served as lead agency and coordinator for preparation of Appendix VIII. Primary responsibility, for the presentation of present watershed problems and projected future needs for land measures and watershed protection, was assigned to the Soil Conservation Service, Forest Service, and Bureau of Land Management, for major cropland, forest land, and rangeland parts of the appendix, respectively. Representatives of state and other Federal agencies in the study group provided useful suggestions and made in-depth review.

Appendix IX - Irrigation The Bureau of Reclamation served as the lead agency for Appendix IX and was responsible for coordinating the collection of data, compilation, evaluation, and preparation of the appendix. Many State and Federal agencies made valuable contributions in collection and analysis of basic data. The Soil Conservation Service provided the present irrigated acreage. Idaho Water Resource Board, Oregon State University, Oregon State Engineer's Office, Montana Water Resources Board, Washington State University, University of Idaho, and the Soil Conservation Service assisted in establishing the land classification standards, mapping and compiling acreages of potential irrigable land, and assisting in estimating present and future farm irrigation water requirements and depletions.

Appendix X - Navigation Leadership responsibility for Appendix X, "Navigation," was delegated to the Corps of Engineers. This is the only agency in the Columbia-North Pacific Study area active in this field and it has broad, nationwide responsibilities in navigation as well. The Corps was selected to prepare all portions of the appendix. Valuable inputs were made by various port districts in the region.

Appendix XI - Municipal and Industrial Water Supply The Environmental Protection Agency served as lead agency for the Municipal and Industrial Water Supply Appendix. This agency was responsible for the coordination of data collection, compilation, and initial evaluation, and for preparation of the appendix. The Oregon Department of Environmental Quality developed basic criteria used in the projection of municipal and rural-domestic water demands. Individual members of the Economic Work Group provided specific information in the fields of forest products, agriculture, and mineral industries used in estimating industrial water requirements. Additional economic input for subregions in Idaho was provided by Idaho State University. All members of the study group provided assistance in reviewing material for completeness and accuracy.

Appendix XII - Water Quality and Pollution Control The Environmental Protection Agency also served as lead agency for the Water Quality and Pollution Control Appendix. This agency was responsible for overall coordination of data collection and analysis, as well as for preparation of the appendix.

The Oregon Department of Environmental Quality, Washington Water Pollution Control Commission, Idaho Department of Health, Montana State Board of Health, Wyoming State Engineer's Office, and the Wyoming State Health Department provided a major portion

of the basic information, updated water and waste inventories, etc. These agencies have also given an in-depth review of material prepared for their respective areas. All members of the study group provided assistance in reviewing the appendix material for completeness and accuracy.

Appendix XIII - Recreation The Bureau of Outdoor Recreation served as lead agency for the Recreation Appendix and was responsible for overall coordination and final preparation of the appendix. All members of the study group assisted in the review. After initial agency review, an ad hoc committee consisting of the Bureau of Outdoor Recreation, the Bureau of Land Management, and the Forest Service worked for several months to modify the appendix format and incorporate all review comments.

The National Park Service assisted in drafting subregion maps and was responsible for preparing the draft of Subregion 4. The Forest Service was responsible for preparing drafts of Subregions 6 and 7. This agency also provided information concerning recreation use throughout the region. The Bureau of Land Management prepared the drafts of Subregion 12 and the Oregon portion of Subregion 10 and provided information concerning recreation on lands under its jurisdiction. The draft of Subregion 8 was prepared by the Corps of Engineers.

The Bureau of Indian Affairs provided information on Indian lands and assisted in drafting maps. The Bureau of Reclamation assisted in preparing present status information and in drafting subregion maps and typed and printed the preliminary field level review draft. Information on hunting and fishing activities was provided by the Bureau of Sport Fisheries and Wildlife. The Soil Conservation Service provided information on the inventory conducted by the National Association of Soil Conservation Districts and on other programs of the Soil Conservation Service. The draft of Subregion 3 and the Washington portion of 10 was prepared by the Washington Interagency Committee for Outdoor Recreation and Washington State Planning and Community Affairs Agency. The Oregon Highway Department, Parks and Recreation Division, assisted in preparing the present status section of the report and provided information on their state programs. The Montana Fish and Game Department, Parks and Recreation Division, also provided information and assistance on the present status portion of the report.

Appendix XIV - Fish and Wildlife The Bureau of Sport Fisheries and Wildlife was lead agency for the Fish and Wildlife Appendix and the greatest contributor to appendix preparation. The coordinator organized and assigned the work, provided guidance and help in the preparation of each section of the appendix,

coordinated its review, and completed its preparation. Bureau draftsmen prepared all final maps. Bureau biologists collected data, prepared the field maps and the initial drafts for eight subregions, and assisted in the initial preparation of four other subregion drafts. They also reviewed all drafts and supplied much of the Regional Summary material. The Bureau of Commercial Fisheries assisted in the collection of data, and prepared preliminary drafts of the fisheries sections for five subregions and for the Regional Summary, as well as reviewing all drafts.

The Idaho Fish and Game Department collected data and prepared the preliminary written material for three subregions, furnished material for the Regional Summary, and reviewed all drafts. The Montana Department of Fish and Game collected data, wrote the original draft for one subregion, and provided material for the Regional Summary. Other State and Federal agencies which provided basic data and review guidance include: Fish Commission of Oregon, Oregon Game Commission, Washington Department of Game, Wyoming Game and Fish Commission, Bureau of Land Management, U.S.D.A. Forest Service, Bureau of Indian Affairs, Bureau of Outdoor Recreation, Corps of Engineers, National Park Service, and the Soil Conservation Service.

Appendix XV - Electric Power The Electric Power Appendix, including text, tables, and illustrations, was prepared by three Federal agencies, with advice by designated individuals in five of the Pacific Northwest States and the Bureau of Reclamation. As lead agency, Bonneville Power Administration provided the coordinator, and maintained necessary liaison with the Technical Staff. This agency prepared sections of the appendix on Introduction, Present Resource Situation, Regional Electric Power Requirements, Projected Transmission Facilities, and Site Selection of Thermal Electric Plants.

The largest contribution to the appendix, in terms of man-months of effort, was provided by the Corps of Engineers. The Corps prepared appendix sections on Hydroelectric Resources, Pumped Storage, Staging of Hydropower Development, and Water Requirements and Management Needs for Power. The regional office of the Federal Power Commission prepared sections on national power requirements, nuclear electric plants and fossil fuel fired generating plants. All members of the study groups provided guidance and reviewed all drafts.

Appendix XVI - Comprehensive Framework Plans Framework plans for the 12 subregions in the study area were developed by the six task forces described in the section on "Coordination and Administration." Each of these task forces was chaired by a state

representative, with planning assistance by task force members and backup personnel from several Federal and State agencies. The six task forces were as follows:

Subregion 1 chaired by Montana.

Subregions 2, 3, and 11, and the Washington portions of 7, 8, and 10 chaired by Washington.

Subregions 4 and 5 chaired by Idaho.

Subregion 6 chaired by Idaho.

Subregion 12 and the Oregon portion of 7 chaired by Oregon.

Subregion 9 and the Oregon portions of 8 and 10 chaired by Oregon.

Subregional plans were developed and then consolidated into four broad hydrologic-political areas. This provided a basis for making shifts among the subregions and allowed planning to be tied into water supply units where a relatively complete system could be covered and presented in the proper context.

Areas delineated were:

Area A - Upper Columbia River Area, Subregions 1, 2, and 3.

Area B - Snake River Area, Subregions 4, 5, and 6.

Area C - Middle Columbia River, Oregon Closed Basins, and Oregon Coastal Area, Subregions 7, 9, 10S, and 12.

Area D - Lower Columbia and Washington Coastal Area, Subregions 8, 10N, and 11.

Leadership for the accomplishment of the area plans was provided by the states:

Area A - Washington

Area B - Idaho

Area C - Oregon

Area D - Washington

Many State and Federal agencies participated in the groups responsible for consolidating subregional plans and drafting related appendix material. The Technical Staff provided guidance and assistance to these groups.

After review and comment by the Regional Plan Formulation Task Force, area plans were revised and combined into the preliminary field level review draft of Appendix XVI, Comprehensive Framework Plans.

The principal Federal agencies assisting in framework plan formulation were the Corps of Engineers, Bureau of Reclamation, Soil Conservation Service, Fish and Wildlife Service, Forest Service, Bureau of Land Management, Environmental Protection Agency, and Bureau of Outdoor Recreation.

The more detailed Type 2 studies for the Willamette and Puget Sound Subregions were already underway when the Columbia-North Pacific Study began. Plans developed in these studies were summarized for these two subregions and incorporated into the regional plans.

Overall guidance to the six plan formulation task forces was given by a Regional Plan Formulation Task Force. This group also had responsibility for developing regional plans and preparing the Regional Summary for Appendix XVI. In addition to the Technical Staff, representatives of the States of Idaho, Montana, Oregon, Washington, and Wyoming and the Departments of Agriculture, Army, and Interior served on this group. Guidelines for plan formulation were drafted by the Commission staff and the Columbia-North Pacific Technical Staff and adopted by the Commission.

ACKNOWLEDGEMENTS



ACKNOWLEDGMENTS

It is impossible to acknowledge all those who have contributed to a study of this magnitude covering all or parts of seven states and being conducted by so many State and Federal agencies. Since the framework studies were not designed to develop new basic data, heavy reliance has been made on previously accomplished work. Many of the previous studies used during the course of this study are listed in a following section of this appendix. In addition, several of the appendices contain bibliographies of reference works.

In addition to the cooperating agencies discussed in the preceding section, special mention should be made of several studies and agencies which have helped materially in completing this long and often arduous task. Personnel working on the earlier Type I studies in other regions were especially helpful in advising of the pitfalls to avoid and in counseling how they envisioned these studies should be scoped and conducted. This was a new venture nationwide, and there were many viewpoints as to what was wanted and what was expected. The people working on the Ohio, the Upper Mississippi, and especially the Missouri Basin studies, where problems were similar to those of the Northwest, were most helpful in providing outlines, study plans, and drafts of prepared material. Much was also learned from the simultaneous study in the North Atlantic Region, and insights and viewpoints were even gained from the Pacific Southwest studies, which started 2 years later than the Columbia-North Pacific Study.

The Puget Sound and Willamette Basin studies, both of which were scheduled for completion 2 years ahead of the Columbia-North Pacific Study, carried the burden of developing data and plans for the two most populous subregions. The outlines and study plans prepared for these studies were also most useful when the Columbia-North Pacific Study was first being organized.

Certain parts of these earlier studies were very useful as first drafts suitable for modification to fit the Columbia-North Pacific Study. Notable in this regard was the draft of Federal legislation prepared by the Missouri Basin Study and used in preparing Appendix III. Also used was the draft describing the authorities, organizations, and responsibilities of the Federal agencies prepared for the Puget Sound Study and adapted for Appendix III.

One of the little recognized contributions of inestimable value in all water resource planning in the Northwest is the series of River Mile Indexes prepared by the Hydrology and Hydraulics Committee of the Pacific Northwest River Basins Commission.

Another important study deserving special mention is the multivolume "Pacific Northwest Economic Base Study for Power Markets" prepared by the Bonneville Power Administration.

The Departments of Employment for the States of Idaho, Oregon, and Washington provided covered employment data for the subregions and the region through a contract with the Corps of Engineers. The Agricultural Experiment Stations of the Pacific Northwest provided information and projections concerning crop yields, fertilizer applications, and feeding rations and efficiencies. The Soil Conservation Service provided useful data on land use for both the field studies and National Program of the Economic Research Service; and the Pacific Northwest Forest and Range Experiment Station provided additional inputs and analyses to the Forest Service portion of the National Program.

In the navigation studies, the Port of Portland and the Washington Public Ports Association were particularly helpful. A study and report on projected water-borne cargo and facility and channel requirements for the Columbia River system to Lewiston, Idaho, and Salem, Oregon, and the Oregon coastal ports was prepared by the Port of Portland as an input to the Columbia-North Pacific Study. Port officials of Idaho, Oregon, and Washington contributed to the study through participation in conferences and review and the provision of basic data.

The Regional Solicitor's Office, Department of the Interior, prepared that part of Appendix III, dealing with Treaties and Compacts, and furnished legal assistance to the study whenever called on.

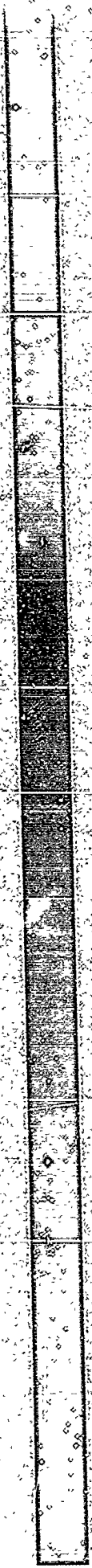
The printing shops in the Corps of Engineers, Portland District Office; the Soil Conservation Service, Portland; Bonneville Power Administration, Portland; and the Government Printing Office, Seattle, printed the many working papers, appendix drafts, and final reports. Assistance was also given by these agencies in drafting and stenographic services.

The Corps of Engineers kept and distributed the accounts for all of the coordinated joint-funded services and supplies and furnished the central office equipment and furniture.

The Pacific Northwest River Basins Commission provided the very fine office space for the Technical Staff and its supporting staff.

There are other agencies and individuals which have not been listed, however, it would be impossible to list all. Those who desire more detail on principal individual study contributors will find such listed at the front of each appendix.

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PUBLIC INFORMATION ACTIVITIES

Recognizing that the success of any water resource planning is dependent upon public acceptance, both CBIAC and, later, the Pacific Northwest River Basins Commission have given high priority to keeping the public informed concerning the Columbia-North Pacific Study program. To reflect the public's viewpoints, primary reliance has been placed on the states' representatives on the various study groups and task forces. In the final analysis, however, the members of the Pacific Northwest River Basins Commission have reflected the public's views in the selected plans and recommendations.

The first public meeting devoted to the Columbia-North Pacific Study was held by the Columbia Basin Inter-Agency Committee in Portland, Oregon, on December 14, 1965, shortly after first funds were available for the study. This was a kickoff meeting intended to acquaint the public about the pending study. The meeting was attended by about 200 people representing a wide range of regional leaders from governmental agencies, private organizations, industry, and civic and other public groups. Participating Federal agencies outlined the objectives, scope, and general schedule of the study. An opportunity was also provided for Federal and State representatives to indicate their particular responsibilities and interest in participation. Speakers representing six of the seven Pacific Northwest States stated their intent to participate to the maximum extent possible.

A press release was issued by CBIAC on November 10, 1965, when funds were first made available for the Columbia-North Pacific Study and several other releases were made subsequently. A short television program highlighted objectives of the study and a feature story appeared in the Portland Oregonian and many other papers in the area. An information brochure describing the Columbia-North Pacific Study was widely distributed prior to the CBIAC meeting in December. This brochure was also made available to the public at subsequent CBIAC meetings and distributed at meetings of other organizations such as the Columbia Plateau Resources Council and the Columbia River Water Congress.

A new information brochure was published in August 1966 and distributed widely. Second and third printings were required, and, by March 1967, nearly 10,000 copies had been distributed. A press release by CBIAC advising of the brochure was published in several of the region's newspapers and prompted many requests.

The September 1966 meeting of CBIAC in Boise, Idaho, was devoted entirely to the Columbia-North Pacific Study. The Chairman of CBIAC explained the concept and objective of framework studies on the national and regional level and the Chairman of the Technical Staff outlined the work and types of studies required for the Columbia-North Pacific report. The balance of the meeting was devoted to speakers from Idaho who presented the needs and desires of the state.

The next public meeting of CBIAC devoted entirely to the Columbia-North Pacific Study was held November 30, 1966, in Spokane, Washington. The Chairman of CBIAC again explained how the national program of comprehensive river basin planning is related to planning in the Pacific Northwest, and the Chairman of the Technical Staff discussed the background and objectives of the Columbia-North Pacific Study. The Governor of Washington discussed State-Federal relationships in water resource development. Speakers representing various Washington State interests gave presentations and staffed the discussion panel.

During this period when the coordination of the Columbia-North Pacific Study was under CBIAC, numerous speakers from the participating agencies and officers of CBIAC and the Technical Staff discussed the study and its aims at meetings of various other organizations. These included such organizations as the National Reclamation Association, Natural Resources Forum of Washington, Columbia Plateau Council, States Soil and Water Conservation meeting, Upper Snake River Water Users Association, and others. Also, progress reports were made at all meetings of CBIAC where the Columbia-North Pacific Study was not the main agenda item.

On June 9, 1967, responsibility for coordination of the study passed from CBIAC to the newly organized Pacific Northwest River Basins Commission. Through this change in administration, the priority of the Columbia-North Pacific Study remained high and the work proceeded without interruption. Responsibility for public information activities naturally passed to the Commission and, since that time, the Columbia-North Pacific Study has been an agenda item on every Commission meeting. Sometimes this has amounted to no more than a progress report, but, at other times, the study has been the subject of an entire forum meeting.

The economic base study and projections for the Columbia-North Pacific Study was a featured agenda item at the Commission's meeting in Missoula, Montana, on July 25, 1968.

In December 1968, one full day of the Pacific Northwest River Basins Commission meeting was devoted to the Columbia-North Pacific Region Framework Study. Findings resulting from the inventory of the water, land, and mineral resources of the region

were presented. The economic base study was reviewed and results of the economic projections for 1980, 2000, and 2020 given. In addition, a brief brochure, covering the economic aspects of the study, was distributed at this meeting.

The Chairman and staff of the Commission have promoted understanding of the Columbia-North Pacific Framework Study as the first step in the preparation of the Commission's joint comprehensive plan through appearances on half-hour TV programs in Tacoma-Seattle and Portland, and in short interviews for TV and radio stations throughout the Northwest.

Appearances as guest speaker have been before such groups as chambers of commerce, conservation groups, public utility associations, water and natural resource groups, such as state and national reclamation associations, rivers and harbors congresses; also, granges, League of Women Voters, service clubs, university seminars, state bankers association, and regional farm-city conferences.

The Chairman of the Commission averages approximately four appearances per month before public groups or private associations. The Information Director, assisted by other staff members, in addition to other meetings, contacts most universities and colleges of the region at least twice each per year.

Groups contacted during a representative period, Fiscal Year 1968, include the following:

1. NW Rivers & Harbors Congress, Olympia, Washington.
2. Western States Water & Power Consumers Conference, Sioux Falls, South Dakota.
3. Ephrata Chamber of Commerce, Ephrata, Washington.
4. University Lions Club, Seattle, Washington.
5. Oregon Reclamation Congress, Ontario, Oregon.
6. Centralia Kiwanis Club, Centralia, Washington.
7. National Reclamation Association, Oklahoma City, Oklahoma.
8. Society of American Military Engineers, Portland, Oregon.
9. Washington Industrial Development Advisory Committee, Seattle, Washington.

10. National Water Commission, Washington, D. C.
11. University of Washington Graduate School of Public Affairs, Seattle, Washington.
12. Horse Heaven Irrigation, Inc., Prosser, Washington.
13. Wyoming Water Resources Conference, Riverton, Wyoming.
14. Missouri Basin Inter-Agency Committee, Jefferson City, Missouri.
15. Spokane Chamber of Commerce, Spokane, Washington.
16. Washington Bankers Association, Vancouver, Washington.
17. Western Water Congress, Wenatchee, Washington.
18. Montana Conservation Council, Billings, Montana.
19. Billings Chamber of Commerce, Billings, Montana.
20. Hill Foundation Seminar for Newsmen, University of Oregon.
21. University of Idaho Water Resources Research Institute, Moscow, Idaho.
22. American Water Resources Association Symposium, Banff, Alberta, Canada.
23. Annual Farm-City Regional Conference, Vancouver, Washington.
24. Washington Association of Soil & Water Conservation Districts, Richland.
25. Rotary Club, Vancouver, Washington.
26. Federal Land Bank Association, Vancouver, Washington.
27. Clark County PUD Association, Vancouver, Washington.
28. Woodland Chamber of Commerce, Woodland, Washington.
29. Heppner Soil & Water Conservation District, Lexington, Oregon.

30. League of Women Voters, Salt Lake City, Utah.

31. East Banks Development Assn., Wilbur, Washington.

Information pertaining to the Columbia-North Pacific studies has also been disseminated through news releases, items in the Commission's monthly news letter, 20,000 copies of the Commission's brochure, and interviews with media representatives at Commission meetings. Highlighting this were the hydrology and water report, the land and minerals report, and the economics report which were presented to the Commission on December 5, 1968. In addition, almost 1,000 copies of these reports were distributed to those present and to others who sent in requests following the meeting.

Meetings, conferences, and interviews are held periodically with the chambers of commerce in Seattle, Spokane, Portland, Boise, Missoula, and others; annual State Grange Conventions, service clubs, county extension services, and resource oriented organizations. In addition, representatives of the several participating agencies have discussed the Columbia-North Pacific Study at numerous meetings and conferences.

OREGON

The State of Oregon, through its Water Resources Board, conducted a series of public meetings beginning in October 1970 and extending through March 1971. These meetings presented: (1) a status report of Board investigations and programs; (2) a summary of findings from the Ultimate Needs Study pertinent to the local area; (3) an explanation of the Columbia-North Pacific Regional Framework Study; (4) a briefing on the Framework Plan for the local area; and (5) a discussion of the proposed work leading to development of the State Water Plan. For each meeting, local sponsors made arrangements and generated advance publicity. As a result, over 500 persons attended the 11 meetings held throughout the state, with the attendance on several occasions nearly equalling the hearing room capacity. General response to the effort was quite encouraging and was due, in part, to the interesting manner in which slides were employed to illustrate the program content.

At each meeting, local comments were solicited on the Columbia-North Pacific Region Framework Plan. General information on the Framework Study was distributed at each meeting as well as specific information from the Framework Plan and the Ultimate Needs Study which pertained to the local area in which the presentation was being given. The availability of such material greatly facilitated the excellent news media coverage afforded the presentations.

It was stressed in the public meetings that, although local planners had not participated directly in the plan formulation process for each area, it is significant that the plan formulation task forces have had excellent indirect local inputs available to them. These inputs, upon which the task forces relied heavily, are in the detailed informational hearing records the State Water Resources Board has for all basins as a result of extensive efforts by county resource committees during the past 15 years.

One year following the initial public presentation, the State Water Resources Board is utilizing the Columbia-North Pacific Region's Framework Plan in preparing the more detailed State Water Plan, initially for the major drainage basins west of the Cascade Range. Such efforts involve working with local interests and many of the same agency personnel that participated on the Subregional Plan Formulation Task forces.

IDAHO

Public information meetings were held at eight locations in Idaho by the Idaho Water Resource Board staff in the fall and winter months of 1970 to present information concerning water resource studies, planning, and development in the state and the northwest. The programs dealt with the following primary subjects:

1. Idaho Water Resource Board planning activities and programs. Programs included: Bear River Investigation, Great Basin Framework Study, Pacific Northwest River Basins Study, Federal-State Wild Rivers Studies, Wild and Scenic Rivers Methodology Study, Western States Water Planning Study, FHA County Water & Sewer Studies, OWRR-Southwest Idaho Project Study and Special Studies. Development programs were explained to provide information about that agency activity.
2. After an overall review of the entire program, detailed explanations were presented on the Columbia-North Pacific Framework Study. Overhead viewgraphs, maps, and slides were used to provide visual aids for each speaker. The Pacific Northwest River Basins Commission operations and primary findings from the C-NP studies were presented on a subregional basis for each local area. Brochures and pamphlets containing general information were distributed.
3. The Idaho Water Resource Board's Water Needs Studies were reviewed and explanation was made of how all information would be used in preparing the Idaho State Water Plan.

Newspapers, radio and television stations were contacted concerning the meetings about 3 weeks prior to and again a few

days before each meeting. Approximately 190 persons attended the sessions. Good news coverage was experienced after each meeting.

Discussion was encouraged at the close of each presentation. Form cards were given to those present to be filled out with questions or requests. Most requests were for printed materials.

Information concerning the Pacific Northwest River Basins Commission and the C-NP Framework Study has also been presented to civic clubs, citizens groups, several Federal agency meetings and to a number of legislative committee hearings. One full-scale presentation was made to the Pacific Northwest River Basins Commission at a meeting in Idaho Falls. This program was by local people involved with water resources. They used maps of the upper Snake River Basin and slides depicting specific areas of interest.

MONTANA

During the week of April 13-16, 1970, the Planning Division of the Montana Water Resources Board conducted a series of six meetings throughout the western part of the state. The programs were designed to acquaint local groups with the State and Federal programs as well as to give these local groups an opportunity to present their views on "local opportunities for water resource development."

The State Water Resources Board presentation consisted of a series of slides giving a concise picture of the Board's activity in regard to their State water plan.

A panel of local people was present at each meeting to offer their viewpoint on current water use situation, water resource problems, and anticipated needs for water, plus ideas on needed improvements.

Federal participation consisted of representatives from most of the agencies involved in water resource planning and development. The Columbia-North Pacific Study was also represented. Members of the Federal panel answered questions from local interests on nearly every facet of water use and development.

ANNOTATED LIST OF
PREVIOUS STUDIES

FEDERAL STUDIES

Federal studies of water resources began in the 1800's in conjunction with programs for resource development. Initially, the studies were made for a single purpose, especially the improvement of navigation. Gradually, as authorities were expanded, more and more purposes were included within the planning framework until today all the water resource uses may be encompassed in a single study.

Nationwide Studies

One of the pioneer efforts at a comprehensive appraisal of the Nation's natural resources and their development was the National Resources Board "Report" of 1934, which included reports by water and land committees. This was followed in 1937 by the National Resources Committee report, "Drainage Basin Problems and Programs," which outlined in broad terms developments and control measures to solve existing and potential problems.

The next major nationwide water study was that of the President's Water Resources Policy Commission. In 1950, this Commission was directed to study and make recommendations regarding Federal responsibility for and participation in the:

"development, utilization, and conservation of water resources, including related land uses and other public purposes to the extent that they are directly concerned with water resources."^{1/}

The resulting reports, published in 1950, were: Volume 1, "A Water Policy for the American People"; Volume 2, "Ten Rivers in America's Future"; and Volume 3, "Water Resources Law."

The Senate Select Committee on National Water Resources, established in 1959, was directed to study the extent to which water resource activities in the United States were related to the national interest, and the extent and character of governmental and nongovernmental water resources activities required for all purposes between then and 1980. These wide-ranging

^{1/} Executive Order No. 10095, January 3, 1950, 15 FR 17.

studies resulted in a series of 32 Committee Prints and culminated in a final report in January 1961. Its far-reaching studies and recommendations have led to significant national legislation in the field of water resources. The current program of framework studies covering all of the major water resource regions of the Nation stems directly from recommendations of this Committee.

In 1962, Senate Document 97 was published, entitled, "Policies, Standards, and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources," by the President's Water Resource Council.

The Water Resources Planning Act of 1965 authorized a "national assessment" of the water and related land resources with provisions for updating periodically. In 1968, the Water Resources Council completed the first of these, designated as the "First National Assessment." This study utilized available information to establish water supplies and uses for the base year 1965 and to project general trends in major regions. It also identified existing and emerging problems and provided an inventory of water and related land resource plans.

In addition to these comprehensive studies, several other nationwide inventories and appraisals of a more limited scope have been made covering specific resource facets which are directly related to water resource development. The Soil Conservation Service, Department of Agriculture, compiled, by States, a national "Soil and Water Conservation Needs Inventory" covering soils, land use, and conservation treatments needed on private land. These data for the Columbia-North Pacific Region States, published in 1962 and 1963, were updated and republished in 1968 and 1969.

In 1941, the National Park Service completed a report entitled "A Study of the Park and Recreation Problem of the United States." This report, which was prepared under authority of the Park, Parkway, and Recreational Area Study Act of June 1936, reflects the preliminary findings of the various states cooperating in the study and embodies recommendations of the Service for coordinated nationwide planning. Lands administered by the Department of Agriculture were not included in the study.

The first national inventory of recreation was completed in 1962 by the Outdoor Recreation Resources Review Commission. This report pointed out the fundamental relationship between water and recreation and the importance of water to more fully satisfy increasing demand and more adequately keep pace with recreation user trends. The report, "Parks for America," 1964, prepared by the National Park Service, Department of the Interior,

presents an inventory of existing nonurban parks, plus additional areas meriting public protection and management. The Bureau of Outdoor Recreation's report on the nationwide trail study (Trails for America, December 1966) recommended the establishment of a nationwide system of trails consisting of three categories; national scenic trails, park and forest trails, and metropolitan trails. A national survey of existing public recreation lands, waters, and facilities was conducted by the Bureau of Outdoor Recreation in 1964 and 1965, for use in preparation of a Nationwide Outdoor Recreation Plan. A report entitled "Outdoor Recreation Trends," based in part on this inventory, was published in 1967. The Forest Service, Department of Agriculture, has prepared a "National Forest Recreation Plan" for each of the national forests in the United States. The use and expenditures of hunters and fisherman in the United States were compiled into the "National Survey of Fishing and Hunting, 1965 (1960) (1955)" from surveys by the Bureau of Census (1960 and 1965) and Crossley S-D Surveys, Inc. (1955). The Bureau of Outdoor Recreation conducted an inventory and study of the Nation's island recreation resources. In-depth studies were made on Cypress Island in Puget Sound and Wildhorse Island in Flathead Lake, Montana.

"Timber Trends in the United States," February 1965, is the latest in a series of periodic appraisals of the timber situation and outlook in the United States. It supplements the forest surveys of the individual states that are conducted periodically by the Forest Service in cooperation with various state agencies and private cooperators and is the basis for the forest industry economic projections in the Columbia-North Pacific Region.

The "National Power Survey," published in 1961 by the Federal Power Commission, represents the first comprehensive study of the power industry as a whole, covering the entire Nation and all ownership segments. The survey was conducted by the FPC as the most effective means of carrying out the provisions of Section 202(a) of the Federal Power Act, which directs the Commission to promote and encourage interconnections and coordination of electric utility systems for the purpose of assuring an abundant supply of electric energy throughout the United States with the greatest possible economy, and with regard to proper utilization and conservation of natural resources.

Regional Studies

There have been four principal water resource studies covering the Columbia River Basin which formed a framework for subsequent investigations. These are:

"Columbia River & Minor Tributaries," July 1931,
Corps of Engineers, H.D. 103, 73rd Congress,
1st Session, March 1932.

"The Columbia River," February 1947, Bureau of
Reclamation, H.D. 473, 81st Congress, 2nd Session,
February 1950.

"Columbia River and Tributaries," October 1948,
Corps of Engineers, H.D. 531, 81st Congress,
2nd Session, March 20, 1950.

"Water Resource Development of the Columbia River
Basin," June 1958, Corps of Engineers, H.D. 403,
87th Congress, 2nd Session, 1963.

These reports present plans for the development of the water resources of the basin.

Numerous other Federal agency studies covering all or a major segment of the region have been prepared. Most of these relate to a single aspect or use of the water and related land resources. Some of the most recent studies are listed here.

"The Lewis and Clark Trail, a Proposal for Development," prepared by the Bureau of Outdoor Recreation for the Lewis and Clark Trail Commission, identifies historic preservation needs and recreation opportunities along the route.

"Water Pollution in the Pacific Northwest Drainage Basins," Public Health Service, 1951--covers use of water resources, water pollution and resulting damage, pollution prevention measures in effect, benefits from pollution prevention, and abatement measures required.

"Statement on Water Pollution Control and Quality Management Programs of the Pacific Northwest," Public Health Service, 1963--for the Subcommittee on Natural Resources and Power, House Committee on Government Operations covering cause and effect of water pollution in the Pacific Northwest.

"Battelle Report on Nuclear Powerplant Siting in the Pacific Northwest," Battelle-Northwest, Battelle Memorial Institute 1967. Study for Bonneville Power Administration of suitable locations for nuclear powerplants.

"Economic Base Study of Power Markets," Bonneville Power Administration, 1964 to 1968--separate studies of five factors and 16 basic industries to determine probable economic development of Pacific Northwest over next 2 decades and electric power requirements of projected development.

"A Ten Year Hydro-Thermal Power Program for the Pacific Northwest," Bonneville Power Administration, January 1969. A 10-year projection of regional power requirements and a coordinated regional plan to meet those needs.

"Projected Developments of the Timber Economy of the Columbia-North Pacific Region," PNW-84, Pacific Northwest Forest and Range Experiment Station, 1969.

"The Role of Water in Shaping the Economy of the Pacific Northwest," U.S.D.I. Geological Survey for Bonneville Power Administration, 1965. Describes and analyzes regional hydrologic system to determine available water supply and its adequacy to meet needs to year 2010.

"The History and Development of the Fisheries of the Columbia River," U.S.D.I. Bureau of Fisheries, 1940. History of commercial fisheries with description of gear and methods.

"A Survey of the Columbia River and Its Tributaries with Special Reference to the Management of Its Fishery Resources," Fish and Wildlife Service, 1948-1950.

"Recreation Survey of the Pacific Northwest Region, Part One - Existing Recreation Areas," Recreation Subcommittee, Columbia Basin Inter-Agency Committee, March 1961.

"Recreation Survey of the Pacific Northwest Region, Part II - Recreation Report," Recreation Subcommittee, Columbia Basin Inter-Agency Committee, October 1964.

"Long-Run Projections of Food Processing and Marketing in the West," Economic Research Service, June 1965.

"Land and Water Inventory," by county for each of the States of Idaho (1948-1950), Oregon (1948), and Washington (1948), by the Soil Conservation Service.

Major Subregional Studies

Comprehensive joint studies of the Willamette River Basin (Subregion 9) and Puget Sound and Adjacent Waters (Subregion 11) have been completed recently. These studies were carried out by the affected states and essentially the same Federal Departments involved in the Columbia-North Pacific Study. These two studies, with some modification, have been incorporated into this one.

Subregional Special Studies

The various departments of the Federal Government have carried out numerous investigations pertaining to particular facets of the water and related land resources for limited portions of the region. Only a selected few of these, having rather broad areal or subject coverage, are included here.

Department of Agriculture

The Department of Agriculture has a continuing program of cooperative surveys by counties or survey areas, which began in the region in the early 1900's and has resulted in the coverage of a major part of it.

Significant water and land resource study programs in the Department are the Type IV Surveys currently being conducted in Oregon and portions of Washington. These studies are prepared jointly by the Soil Conservation Service, Economic Research Service, Forest Service, and the two states involved. To date, reports have been published on Oregon River Basins, in cooperation with the Oregon State Water Resources Board, as follows:

"Hood River Basin," February 1964.

"John Day River Basin," September 1961.

"Umatilla River Basin," December 1962.

"Willamette River Basin Interim Report," November 1964.

"North Coast Drainage Basin," June 1966.

"Middle Coast Drainage Basin," September 1964.

"South Coast Drainage Basin," February 1962.

"Malheur Lake Basin," April 1967.

"Powder River Basin," December 1965.

Studies completed by individual agencies within the Department of Agriculture are listed below.

Agricultural Research Service Studies in all phases of water use and management are a continuing program in the region.

"Water Yield Map for Idaho," March 1968.

Economic Research Service Several studies have been completed recently by the Economic Research Service that are of importance to this framework study. These include:

"Agricultural Projections: Willamette Basin, Oregon, 1966" (for Type 2 study).

"Agricultural Development in the Puget Sound Region," July 1968 (for Type 2 study).

Forest Service The Forest Service has conducted many hydrologic investigations of National Forest Lands in the Columbia-North Pacific Region. They have appeared in many publications and are too numerous to mention. Other studies, including surface water, ground water, and water quality, are continuing. Data from these studies are forwarded to the U.S.D.I. Geological Survey, Washington, D. C., for eventual data bank storage.

Subregional studies of projected economic activity in the forest products industry have been carried out by the Pacific Northwest Forest and Range Experiment Station. These include:

"Prospective Timber Supplies and Forest Industrial Development in the Willamette River Basin," September 1965 (for Type 2 Study).

"Prospective Timber Supplies and Forest Industrial Development in the Puget Sound Basin and Adjacent Waters," 1966 (for Type 2 Study).

Soil Conservation Service Under the recently enacted Resource Conservation and Development Program, the Soil Conservation Service has assisted the State Committees in the preparation of several plan reports for portions of the region. These reports include:

"Idaho-Washington," December 1964.

"The Bitterroot Valley," Montana.

"Upper Willamette," Oregon, December 1964.

"Box Elder County," Utah, June 1967.

"Western Wyoming," July 1968.

The Soil Conservation Service has also reported on drainage studies of several rather extensive areas in the region. Available reports are:

"Emmett Valley," Idaho, May 1954.

"Northeast Blackfoot," Idaho, August 1960.

"Sterling Bench," Idaho, April 1960.

"Bear Creek Valley," Oregon, August 1963.

Two other studies which the Soil Conservation Service has completed that are somewhat comprehensive in nature are:

"Consumptive Use of Water in Columbia River Basin, in Nevada," 1952.

"U.S.D.A. Reconnaissance Study of Erosion, Sedimentation and Related Land Resources, Portneuf River Basin, Idaho," September 1965.

Department of the Army

The Corps of Engineers has prepared numerous reports on water resource development for various parts of the region. A few of these are:

"Tualatin River, Oregon," S.D. 94, 84-2, 1955.

"Silvies River, Oregon," unpublished, 1957.

"Green and Duwamish River, Washington," H.D. 271, 81-1, 1949.

"Umatilla River, Oregon," unpublished, 1955.

"Rogue River," Oregon, H.D. 566, 87-2, 1962.

"Willamette River, Oregon," H.D. 544, 75-3, 1938.

"Willow Creek, Oregon," H.D. 233, 89-1, 1956.

"Grande Ronde River, Oregon," H.D. 280, 89-1, 1965.

"Middle Snake River," S.D. 51, 84-1, 1955.

"Skagit River, Washington," H.D. 483, 89th Congress, 2d Session, 1966.

"Snoqualmie River Washington," 1969, in process to Congress.

A report "Upper Snake River Basin," 1961, was prepared jointly with the Bureau of Reclamation.

Federal Power Commission

The Federal Power Commission's principal reporting on the region of a comprehensive nature has been their series of "Planning Status Reports." These reports show data on existing water resource developments and known potentials, summarize the license status of non-Federal hydroelectric development, review planning studies, and identify the needs for additional planning. Reports which cover parts of the region are:

"Puget Sound and Washington Coastal Basins."

"Middle Columbia River Basin."

"Lower Columbia River Basin."

"Kootenai River Basin."

"Clark Fork-Pend Oreille River Basin."

"Willamette River Basin."

"Oregon Coastal Slope Basins."

"Rogue River Basin."

"Lower Snake River Basin."

"Upper Snake River Basin."

Department of Health, Education, and Welfare

Prior to January 1, 1966, the Public Health Service conducted water pollution studies which are now handled by the Environmental Protection Agency. Those reports which the Public Health Service completed and which include analyses of complete river basins or large areas are covered by the following Water Supply and Water Quality Control Studies: (Several of these reports were prepared for other agencies involved in construction programs.)

"Mill Creek Project, Walla Walla River Basin," 1965.

"Columbia Basin Irrigation Project, Upper Columbia River Basin," 1965.

"Catherine Creek and Lower Grande Ronde Reservoirs," 1962.

"Willamette River Basin, Scoggins Reservoir," 1962.

"Medford Division, Rogue River Basin," 1965.

"Willamette River Project, Red Prairie Division, Gorge Reservoir," 1965.

"Water Resource Study, Pend Oreille River Basin," 1963.

Department of Commerce

Economic Development Administration The act creating this agency requires that each redevelopment area (usually counties) submit initially a description of its development program in an Overall Economic Development Report. Subsequent reports provide a more thorough analysis of area conditions; progress reports are submitted annually.

Department of the Interior

Many of the agencies within the Department of the Interior are concerned with conservation, preservation, and use of the Nation's water resources. Only those which have made studies and prepared reports of a comprehensive nature are covered here.

Bureau of Mines The Bureau of Mines has done limited research on water requirements of the mineral industry. One report that is available for this region is "Water Use Practices and Requirements of Montana Mineral Industries, 1963." The Bureau also conducts investigative research of pollution problems caused by acid mine water drainage, mainly from anthracite and bituminous coal mines.

Bureau of Outdoor Recreation The Bureau of Outdoor Recreation, which was established in 1962, conducts planning to protect natural beauty and the quality of outdoor environment, and for outdoor recreation. Of importance to this study are a series of Study Reports prepared for the Wild Rivers Study team. Those relating to the region are:

"Skagit River and Its Cascade, Sauk, and Suiattle Tributaries, State of Washington," Northwest Regional Task Group, July 1, 1964.

"Rogue River, Oregon," Pacific Southwest Regional Task Group, July 1, 1964.

"North, Middle, and South Forks the Flathead River, State of Montana," Northwest Regional Task Group, July 15, 1964.

Also of significance is a report prepared by Battelle Institute for the Bureau of Outdoor Recreation entitled:

"An Economic and Social Evaluation of Establishing Portions of the Salmon and Clearwater Rivers, (Idaho) as Wild Rivers," August 1964.

These studies resulted in a determination that portions of these streams met the criteria for wild river consideration; plans for their management and use were proposed.

"The North Cascade Study Report," prepared by the North Cascades Study Team and published by the U.S. Department of the Interior and U.S. Department of Agriculture.

Bureau of Reclamation The Bureau of Reclamation has prepared numerous reports on water resource conservation and development for various areas of the region. Those of recent date and the ones currently being studied which may be considered of a comprehensive nature are:

"Clark Fork Basin," 1959.

"Kootenai River Basin," 1959.

"Pend Oreille River Basin," 1964.

"Southwest Idaho Water Development Project," 1966.

"Southwest Idaho Water Development Project, Weiser River Division," 1970.

"Umpqua River Basin," 1956.

"Upper Chehalis River Basin," 1965.

"Upper Snake River Basin," 1961.

"Upper John Day Project," 1970.

"Burnt River Project, Oregon, Dark Canyon Division," 1970.

"Chief Joseph Dam Project, Okanogan-Similkameen Division, Okanogan Unit," 1970.

Environmental Protection Agency

The Environmental Protection Agency has prepared reports of water quality control and management for two subregions. These are:

"Willamette River Basin, Water Quality Control and Management," 1966.

"Water Quality Control and Management, Snake River Basin," 1968.

In addition, this agency has prepared a number of water supply and water quality control study reports for complete river basins. These include:

"Twin Springs Project, Boise River Basin," 1966.

"Southwest Idaho Water Development Project, Weiser River Basin," 1966.

"Tiller and Galesville Projects, Umpqua River Basin,"
1966.

"Skagit River Basin Project, Puget Sound Basin," 1966.

"North and Middle Fork Snoqualmie Project, Snohomish
River Basin," 1966.

"Bumping Lake Enlargement, Yakima River Basin," 1966.

"Dark Canyon Division, Burnt River Basin," 1966.

"Sultan Dam Project, Snohomish River Basin," 1967.

"Middle Snake River Water Resources Development,"
February 1968.

Fish and Wildlife Service

"Fish and Wildlife Resources of the Rogue River Basin,"
April 1956.

"A Survey of Fish and Wildlife Resources of the Middle
Snake River Basin, Idaho, Oregon, and Washington,"
November 1964.

"A Detailed Report on Fish and Wildlife Resources
Affected by Columbia Basin Project, Washington,"
July 1964.

Reports on Preliminary Surveys of Fish and Wildlife include:

"Pend Oreille River Basin, Idaho and Washington," 1963.

"Kootenai River Basin, Montana and Idaho," June 1961.

"Middle Snake River Basin, Idaho, Oregon, and
Washington," November 1964.

Geological Survey The Conservation Division of the
Geological Survey has prepared about 60 river basin reports that
either describe the water-power resources of the basin or are
concerned with a review of water-power classifications and
withdrawal of lands. The reports are available at the Conservation
Division offices in either Portland, Oregon, or Tacoma, Washington.

National Park Service

"Recreation Resources of the Rogue River Basin,"
June 1954.

"Pacific Coast Recreation Area Survey," 1959. A survey to inventory and report on important undeveloped areas, or areas with relatively sparse development valuable for recreation and other public purposes, along the Pacific Coast.

STATE STUDIES

Truly comprehensive studies of their water resources were undertaken by the individual states of the region only recently. Early investigations were concerned principally with single-function developments such as irrigation, soils mapping, ground-water studies, and basic data collection. However, with the close of World War II came general recognition that significant postwar adjustments in resource utilization were taking place. It was also realized that, if these adjustments were to be orderly, some comprehensive planning was necessary. Development of the necessary programs, obtaining recognition of their importance by the State legislatures, funding, and implementation, have all required considerable time. In recent years, though, significant contributions to the comprehensive planning for water resource use have been made by most states of the region.

Idaho

State Water Resources Board

"Loans for Water Resource Development," May 1969.

"Idaho Water Resources Inventory," October 1968.

"Water Data Availability and Status, 1968."

"Soils Survey Reports," 15 Idaho Counties, July 1968 to May 1969.

"Potentially Irrigable Soils Reports," 29 Idaho Counties, October 1969.

"Water Resources Development Projects," January 1969.

"Laws of the Idaho Water Resource Board," June 1969.

"Idaho Economic Base Study for Water Requirements,"
October 1969.

"Aquatic Life Water Needs," November 1969.

"Navigation Water Needs," April 1970.

"Methodology for Evaluating Potential Surface-Water
Reservoir Sites in Idaho," 1971.

"Water-Based Recreation Needs," 1970.

"Agricultural Water Needs - Irrigation Consumptive
Requirements," 1970.

"Hydroelectric Power Water Needs," 1970.

"Water Quality Needs," 1970.

"Potentially Irrigable Lands in Idaho," 1970.

Department of Water Administration

The occurrence of ground water and conditions related to
its development are reported in the "Summary of Ground-Water
Conditions in Idaho," 1966.

"Ground-Water Development in Idaho," No. 17, June 1970.

"Ground-Water Resource of Southern Ada and Western
Elmore Counties, Idaho," No. 15, February 1970.

"The Raft River Basin, Idaho-Utah, as of 1966,"
April 1970.

"Water Level Changes in the Mud Lake Area, Idaho,
1958-1968," January 1969.

"Ground-Water Resources of Northern Owyhee County,"
No. 14, November 1969.

University of Idaho

Three reports by the Agricultural Extension Service at the
University which contain data of value to this study are:

"Water Quality Study in the Boise Valley," 1959.

"Estimated Irrigation Water Requirements in Idaho," 1952.

"Characteristics of Irrigation Waters in Idaho," 1951.

The "Idaho Statistical Abstract," completed by the University, has data and some descriptive information on the economy of Idaho. It covers historical developments and contains data to 1966.

State Bureau of Mines and Geology

The Bureau of Mines and Geology has published numerous reports pertinent to the framework study. Some of the more recent ones include:

Pamphlet 103, "A Survey of Ground Water of the State of Idaho," 1955.

Special Report No. 1, "Mineral and Water Resources of Idaho," U.S.D.I. Geological Survey in cooperation with the Bureau of Mines and Geology, Department of Highways and Department of Reclamation, 1964.

Earth Sciences Series 1, "Idaho Earth Science: Geology, Fossils, Climate, Water and Soils," 1967.

State Fish and Game Department

Reports of the Fisheries Division of the Fish and Game Department cover nearly every aspect of the field. Some of those of particular interest include:

"Middle Snake River Fisheries Studies," 1961.

"Statewide Fishing Harvest Survey," 1954 (1954-1964), 1956--Annual Progress Reports.

"The Effects of Hydroelectric Developments on the Fishery Resources of the Snake River," 1956.

"Salmon and Steelhead Investigations," 1962. (also 1963-1965).

"Water Quality Investigations," November 1, 1960, 1963. (also 1961-1963).

Other studies and reports cover fisheries investigations of various streams, lakes, and reservoirs; timing of fish runs; introduction and reintroduction of trout and salmon to various streams; etc.

Department of Commerce and Development

"An Action Program for Industrial Progress in Idaho,"
June 1968.

Others

"Idaho Outdoor Recreation Plan." A planning program has been established to prepare and maintain a state comprehensive outdoor recreation plan for Idaho. The program has produced an initial plan and appropriate updated revisions. It is a continuing effort to focus attention on the outdoor recreation needs and priorities for the state.

Montana

"Water Resources Programs Conducted by Government Agencies in Montana."

"Montana Register of Dams," a compilation of storage reservoirs having a capacity of 50 acre-feet or more.

"Water Resources and Planning," an explanation of the State Water Plan, its authorization, scope and objectives.

"Montana Water Laws: A Résumé."

"Catalog of Stream Gaging Stations," a schematic approach to historical collection of stream discharge records.

"Summary of Potential Projects in Montana," a compilation of anticipated future developments for water storage and control projects by drainage basin.

"Bibliography of Montana Water Resources and Related Publications."

"An Atlas of Water Resources in Montana by Hydrologic Basin," a 15 map atlas of Montana's drainage basins and resources.

"Montana's State Water Plan, A Progress Report,"
a progress report to Montana's 42nd Legislature.

"A Groundwater Report of Montana," a report by
Miller Hansen of the Montana Bureau of Mines,
and Geology on Montana's groundwater resources.

"River Basin Modeling, An Approach to Computer
Simulation of the Bitterroot-Clark Fork River Basin."

"Water Laws of Montana, 1965," a comprehensive
compilation of the Montana code provisions relating
to water and water uses.

"Water Laws of Montana, 1969; Cumulative Supplement,"
containing amendments to the 1965 edition of Montana
code provisions relating to water and water uses.

Nevada

University of Nevada

Two studies by the University, concerned with irrigation
aspects of the state, have been reported. These are:

"Consumptive Use of Irrigation Water by Crops in
Nevada," 1950.

"Irrigated Lands of Nevada," August 1949.

Oregon

Department of Commerce

"Willamette Basin Land Use Study," 1965.

State Water Resources Board

The State Water Resources Board, by the end of the 1969-71
biennium, will have completed its initial statewide series of
river basin investigations that were begun in 1956. These inves-
tigations inventory the water supply and identify both present
use and needs in the near future, thereby providing the basis for
the Board's statements of state water resource policy. The

Board recently published its report entitled "Oregon's Long-Range Requirements for Water" projecting needs to the year 2070.

During the 1969-71 biennium the Board is also initiating a series of multiple-basin area investigations leading to development of a State Water Plan. The investigations will be development-oriented to bridge the gap between the Board's basin investigation reports and the long-range water requirements report. The proposed schedule would enable completing investigations in fiscal year 1978 before the end of the 10-year moratorium. Board reports completed thus far include:

Umpqua River Basin - July 1958

Snahe River Study, Interim Report No. 1 - August 1958

Rogue River Basin - January 1959

Grande Ronde River Basin - September 1960

Deschutes River Basin - January 1961

Upper Willamette Basin - April 1961

North Coast Basin - June 1961

John Day Basin - March 1962

South Coast Basin - January 1963

Middle Willamette Basin - June 1963

Umatilla Basin - June 1963

Hood Basin - April 1965

Mid-Coast Basin - May 1965

Lower Willamette Basin - June 1965

Malheur Lake Basin - June 1967

Powder River Basin - June 1967

Willamette River Basin - June 1967

Water Sources, Supply, and Quality - Lincoln County
December 1965

Malheur-Owyhee Basin - June 1969

Ultimate Water Needs Study - June 1969

Oregon's Long-Range Requirements for Water - November 1969

Parks and Recreation Division, State Highway Department

In connection with the Willamette River Greenway proposal, a report entitled "Oregon's Willamette River Park System," November 6, 1967, was prepared by the Parks and Recreation Division.

"Oregon Outdoor Recreation - A Study of Nonurban Parks and Recreation."

"Oregon Statewide Comprehensive Outdoor Recreation Plan," prepared in part to qualify the state for participation in the Land and Water Conservation Fund program.

State Department of Environmental Quality

State Fish Commission

State Game Commission

To assist in future recreation planning for the state, the Game Commission has prepared a "Master Plan for Angler Access and Associated Recreational Uses," dated February 1967.

Oregon State University

Oregon State University has completed numerous reports dealing with land and water resource development. Among these are:

"Irrigation Water Values in the Willamette Valley, a Study of Alternative Valuation Methods," September 1965.

"Atlas of the Pacific Northwest Resources and Development," 1962.

"Atlas of Oregon Agriculture," 1962.

"Economic Prospects for the Willamette Valley," 1968.

"Economics of Water Pollution Control," May 1966.

"Willamette River: River Lands & River Boundaries,"
February 1970.

"The Effect of Logging on Stream Temperatures," 1969.

"The Use of Photogrammetry in Predicting Outfall
Diffusion," April 1969.

"Dissolved Oxygen Requirements of Freshwater Fishes,"
1970.

"Oregon's Water-Management Districts," December 1967.

"Legal Aspects of Inter-regional Water Diversion,"
September 1968.

"Consumptive Use & Net Irrigation Requirements for
Oregon," Circ. of Info. 628, OSU Ag. Exp. Sta.,
March 1968.

State Engineer

"Rock Creek Watershed," August 1968.

"Elgin Watershed," January 1968.

Washington

State Department of Agriculture

The "Annual Crop Report" of the State Department of
Agriculture is published each January in cooperation with the
Statistical Reporting Service of the U.S. Department of
Agriculture.

"Atlas of Washington Agriculture," 1963.

"County Agricultural Data Series," 1958-62 and 1963,
compiled from the 1954 and 1959 Census of Agriculture.

Department of Commerce and Economic Development

As part of a comprehensive State Economic Study Program,
the Business and Economic Research Division completed a series of
specialized reports which examine the economic structure of

Washington State. These studies include the following:

Summaries:

"The Washington State Economy - An Input-Output Study."

"Economic Regions of Washington."

Industry Studies:

"Aerospace."

"Electrical Machinery."

"Nonelectrical Machinery."

"Transportation Equipment."

"Agriculture."

"Food Products."

"Lumber and Wood Products."

"Apparel and Textiles."

"Printing and Publishing."

"Distribution Services, Trade, and Transportation."

"Washington Inter-Industry Study for 1963."

"Lumber and Wood Products, Agriculture, Pulp and Paper, Apparel and Textile, Printing and Publishing Industries in the State of Washington."

"Review of State Economic Regions, Analysis of Employment by Counties."

"Economic Projections, State of Washington 1965-1985."

State Department of Fisheries

The State Department of Fisheries' Marine Non-Salmon Unit has made several studies of the Puget Sound region trawl (1966-1967), and nonsalmon sport fisheries (1965), and a survey of hake (1965).

Department of Natural Resources

The Department of Natural Resources, through its various divisions and bureaus, has conducted several studies of the state's water and land resources. These cover such items as zoning, taxes, inventories of state-owned lands and forest industries, aerial photography, management, boundary surveys, geodetic positions, geology and minerals. "A Review--Washington Forest Industries" is published quarterly.

Department of Ecology

The former Department of Water Resources published a number of basic data documents covering snow measurements, lakes, artesian wells, streamflow measurements, geology, ground water, quality of surface water, and water resources. Of particular importance to this study is the 4-volume report, "An Initial Study of the Water Resources of the State of Washington," February 1967, by the State Research Center, under contract from the former Department of Conservation.

The former State Water Pollution Control Commission has reported on a wide variety of water pollution studies and pollution abatement programs and needs relating to domestic and industrial waste discharges throughout the state.

State Planning and Community Affairs Agency

The State Planning and Community Affairs Agency has participated in a wide variety of studies relating to water and related land resource planning which cover small areas, counties, basins, and the state.

A statewide comprehensive planning program was initiated with analytical studies of the state's population, economy, and existing land use. The first element of the state comprehensive plan was a statewide plan for outdoor recreation and open space. These studies are covered by a large number of published reports and working papers which cover the various facets of each study.

"Washington Statewide Outdoor Recreation and Open Space Plan." This plan was prepared by the Interagency Committee to meet all statewide planning requirements prerequisite to Federal financial assistance for outdoor recreation and open space land acquisition and development projects and to meet the requirements of State Initiative 215 for an orderly statewide plan supported by recreation agency 6-year development plans.

State Parks and Recreation Commission

"Pleasure Boating Study, Puget Sound & Adjacent Waters."

Wyoming

Natural Resources Board (Now Department of Economic Planning and Development)

"Reconnaissance Report on Proposed Snake River Diversion (from Snake River to Gros Ventre, Spring Gulch and Flat Creek)," August 1964.

State Engineer's Office

"Water Resources Inventory, Water Division No. 4," 1965.

Water Planning Program Series

Leaflet -- "The Wyoming State Water Plan," Fall of 1968, State Water Planning Staff.

Report No. 1 -- "Computerized System for Wyoming Surface Water Records," September 1968, Revised January 1970, Wyoming Water Resources Institute.

Report No. 2 -- "Objectives and Policies of the State Water Plan," October 1968, Revised 1970, Wyoming Water Planning Program Staff.

Report No. 4 -- "Tabulation of Existing Wyoming Reservoirs Over 500 Acre-Feet Capacity," March 1970, Wyoming Water Planning Program Staff.

Report No. 5 -- "Consumptive Use of Irrigation Water in Wyoming," July 1970, by Frank J. Trelease III, Theodore J. Swartz, Paul A. Rechard, and Robert D. Burman.

Report No. 6 -- "An Approach to the Selection of a Streamflow Base Period," July 1970, by Wm. N. Embree.

Report No. 7 -- "Irrigated Lands Inventory for Wyoming," January 1971, Wyoming Water Planning Program Staff.

Economic Series

"Wyoming Mineral Industries--Review and Forecast," a report prepared for the Wyoming Natural Resource Board and the Wyoming Water Planning Program, September 1969, by Cameron Engineers, Denver, Colorado.

"Demographic Study of Wyoming--Population in Transition," December 1969, by William E. Morgan, Margaret W. Pearl, Florence P. Barker, Division of Economic and Business Research, University of Wyoming.

OTHER

In addition to the studies done by governmental agencies, some have been completed by institutes, financial institutions, consultants, and others covering various resource aspects of the region. A few of these have been brought to the attention of the study and are noted here:

Regional Studies

"Summary of Pacific Northwest Industries, Annual Review." Economic Research Department, Seattle First National Bank, issued annually. Covers principal features of Washington State's industrial base and recent developments.

"Inventory of Salmon and Steelhead Management and Research Programs, Parts I and II," Pacific Salmon Interagency Council, April 1966.

"Inventory No. 7 - Salmon and Steelhead Protection and Transportation Facilities, Part II," June 1965, Pacific Salmon Interagency Council.

"The Pacific Northwest, A Study of Economic Growth in Quality Environment." Battelle Memorial Institute, Columbus Laboratories, Columbus, Ohio, December 1967.

State or Major Subregional Studies

"Economic Growth of the Puget Sound Region," 1965.

"Oregon Today and Tomorrow," 1962. Pacific Power and Light Co.

Smaller Area Studies

"Recreation Outlook 1962-1975," Metropolitan Planning Commission, Portland, Oregon, September 1962.

This appendix is one of a series making up the complete Columbia-North Pacific Region Framework Study on water and related lands. The results of the study are contained in the several documents as shown below:

Main Report

Brochure Report

Appendices

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| I. History of Study | IX. Irrigation |
| II. The Region | X. Navigation |
| III. Legal & Administrative
Background | XI. Municipal & Industrial Water Supply |
| IV. Land & Mineral Resources | XII. Water Quality &
Pollution Control |
| V. Water Resources | XIII. Recreation |
| VI. Economic Base &
Projections | XIV. Fish & Wildlife |
| VII. Flood Control | XV. Electric Power |
| VIII. Land Measures & Watershed
Protection | XVI. Comprehensive Framework
Plans |

Pacific Northwest River Basins Commission
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Vancouver, Washington